

DCS: COMMUNITY A-4E-C

By ALI



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1. INTRODUCTION

The Navy Model A-4E Skyhawk is a single-place monoplane with a modified delta-planform wing manufactured by the McDonnell Douglas Aircraft Company, Aircraft Division, Long Beach, California. It is powered by a P&W J52-P-6A gas turbine engine producing a sea-level static thrust rating of 8500 pounds.

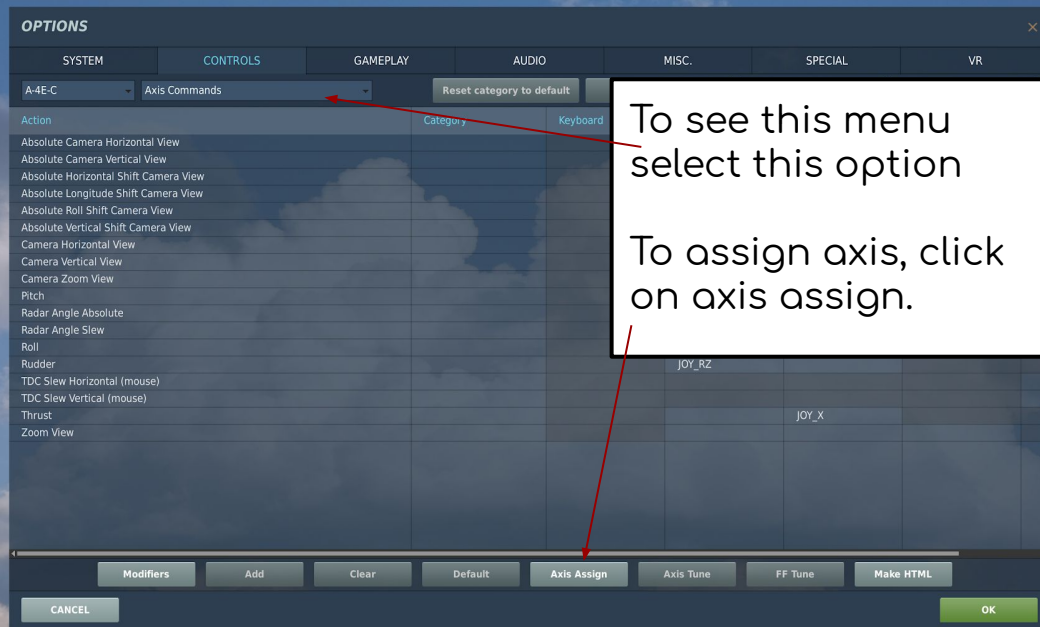


Designed as a high performance lightweight attack aircraft, it mounts two 20-mm guns internally, carries a variety of external stores, and is capable of operating either from a carrier or from a shore base.



Control Setup

2 CONTROLS



Control Setup

As this is a basic jet aircraft, I have a minimum of control assignments, however, there are a few oddities noted here.

I have mapped:

Zoom [num*, num/]

Speedbrake [LShift + B]

Landing Gear [G]

Tailhook [LAlt + G]

Weapon Fire [Space]

Weapon Release [LAlt + Space]

Release Countermeasures [Q]

Wheelbrake [W]

Trim [RCtrl + ; , . /]

Speed Hold Increase [LShift + 0]

Speed Hold Decrease [LShift + 9]

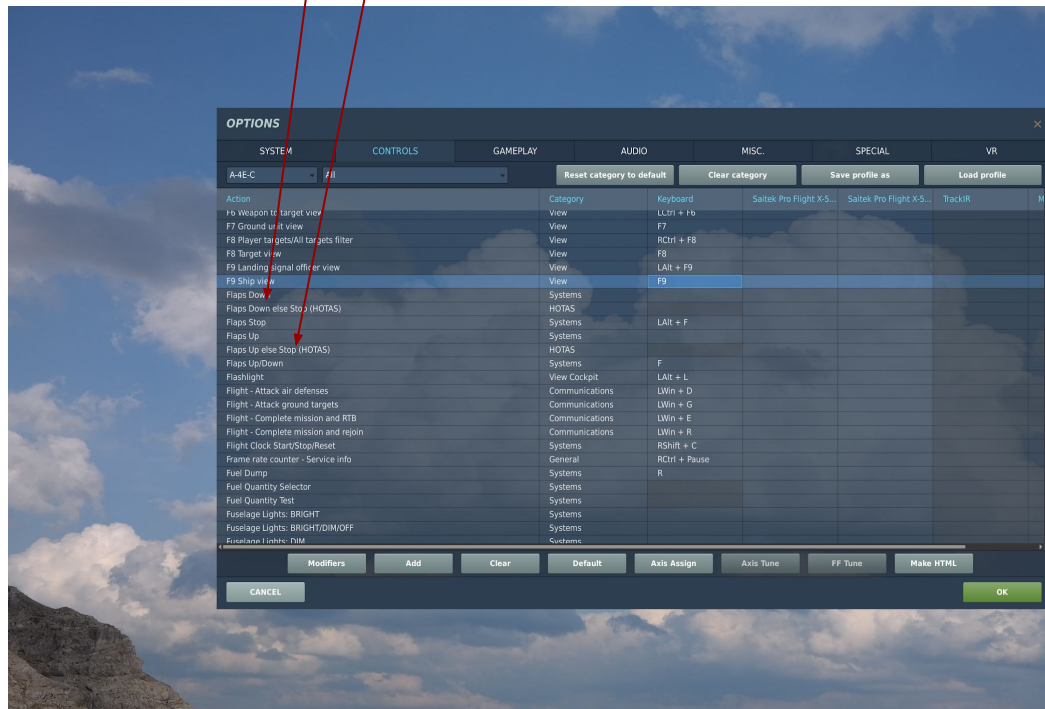
Speed Hold Toggle [LShift + 8]

Radar Hold Increase [LShift + 7]

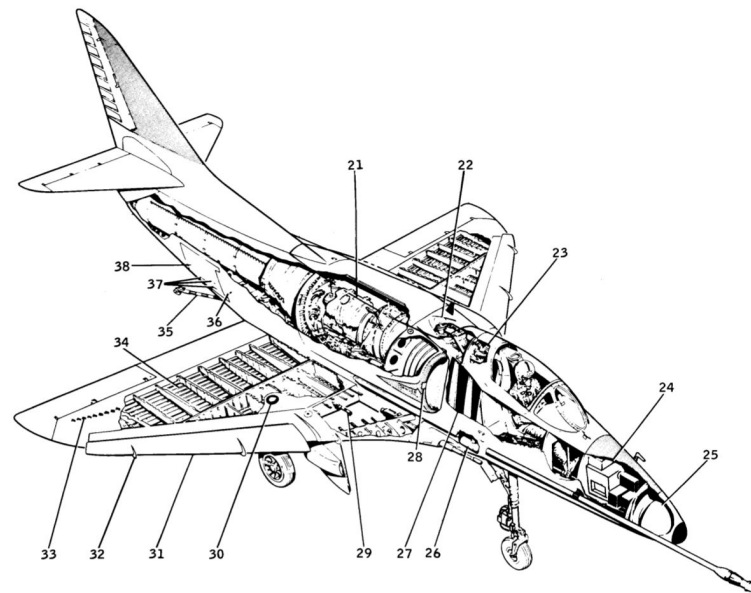
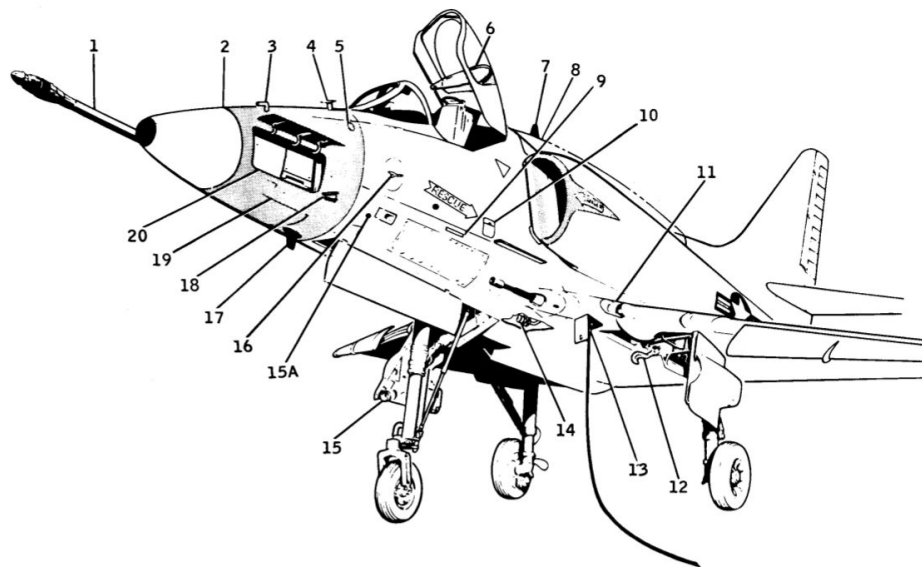
Radar Hold Decrease [LShift + 6]

Radar Hold Toggle [LShift + 5]

To map flaps, use these two assignments. They will increase/decrease flap angle while held. They have no default binding.



3. COCKPIT AND GAUGES

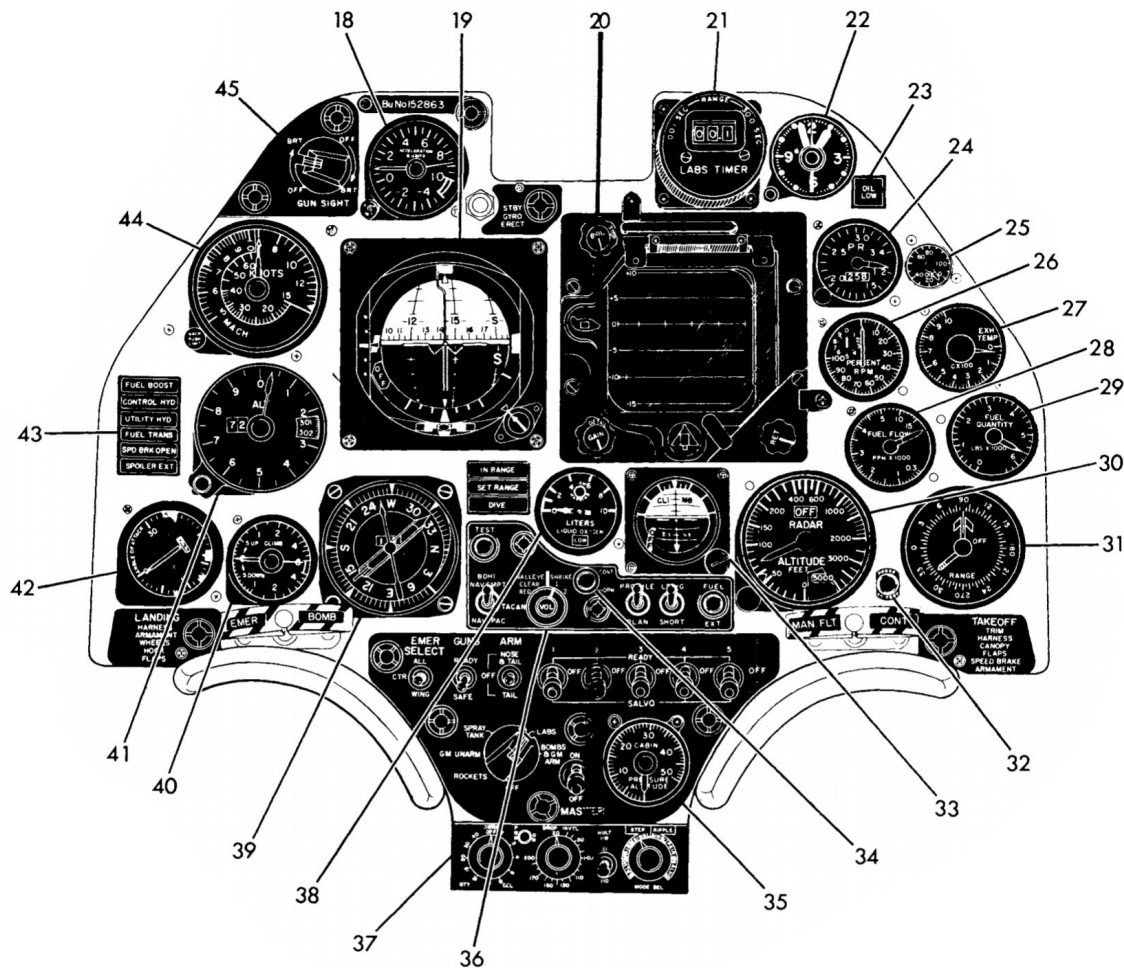


- | | | | |
|---|--|---|---------------------------------|
| 1. Air refueling probe | 11. Approach lights | 20. Nose compartment access door | 29. Catapult hook |
| 2. Radome | 12. Catapult hook | 21. Oil tank | 30. Wing tank filler cap |
| 3. Pitot tube | 13. External power receptacle and access door | 22. Fuselage fuel tank filler cap | 31. Slat |
| 4. Total temperature sensor | 14. Oil tank pressure filler cap | 23. Cockpit canopy air bungee cylinder | 32. Barricade engagement detent |
| 5. Brake fluid level window | 15. Taxilight | 24. Nose section electronic equipment compartment | 33. Vortex generators |
| 6. Thermal radiation closure | 15A. Engine bleed static port | 25. AN/APG-53A/B radar transmitter and receiver group | 34. Integral wing fuel tank |
| 7. AN/ARC-51A (UHF) or AN/ARC-27A (UHF) radio antenna | 16. Angle-of-attack vane and transducer | 26. Emergency generator | 35. Arresting hook |
| 8. Upper avionics package | 17. AN/ARN-52(V) or AN/ARN-21B TACAN antenna | 27. Fuselage fuel tank | 36. JATO igniter terminal |
| 9. Normal cockpit entry handle | 18. Pitot static orifice | 28. Air refueling probe light | 37. JATO mounting hooks |
| 10. External canopy-jettison handle | 19. AN/ARA-50 or AN/ARA-25 (UHF-ADF) antenna cover | | 38. Speedbrake |

3. COCKPIT AND GAUGES



3. COCKPIT AND GAUGES



18. ACCELEROMETER
19. ALL-ATTITUDE INDICATOR
20. RADAR SCOPE
21. LABS TIMER
22. 8-DAY CLOCK
23. OIL QUANTITY INDICATOR SWITCH (LATE A-4E)
24. PRESSURE RATIO INDICATOR
25. OIL PRESSURE INDICATOR
26. TACHOMETER
27. EXHAUST GAS TEMPERATURE INDICATOR
28. FUEL FLOW INDICATOR
29. FUEL QUANTITY INDICATOR
30. RADAR ALTIMETER
31. DEAD RECKONING INDICATOR (EARLY A-4E)
32. RADAR ALTIMETER LOW-LIMIT WARNING LIGHT
33. STANDBY ATTITUDE INDICATOR
34. SIDS CONT-NORM MODE SWITCH
35. ARMAMENT PANEL
36. MISCELLANEOUS SWITCHES PANEL
37. AIRCRAFT WEAPONS RELEASE SYSTEM PANEL (LATE A-4E)
38. OXYGEN QUANTITY INDICATOR
39. BEARING-DISTANCE-HEADING INDICATOR
40. VERTICAL SPEED INDICATOR
41. ALTIMETER
42. ANGLE-OF-ATTACK INDICATOR
43. CAUTION PANEL (LADDER LIGHTS)
44. AIRSPEED INDICATOR
45. GUNSIGHT PANEL

3. COCKPIT AND GAUGES

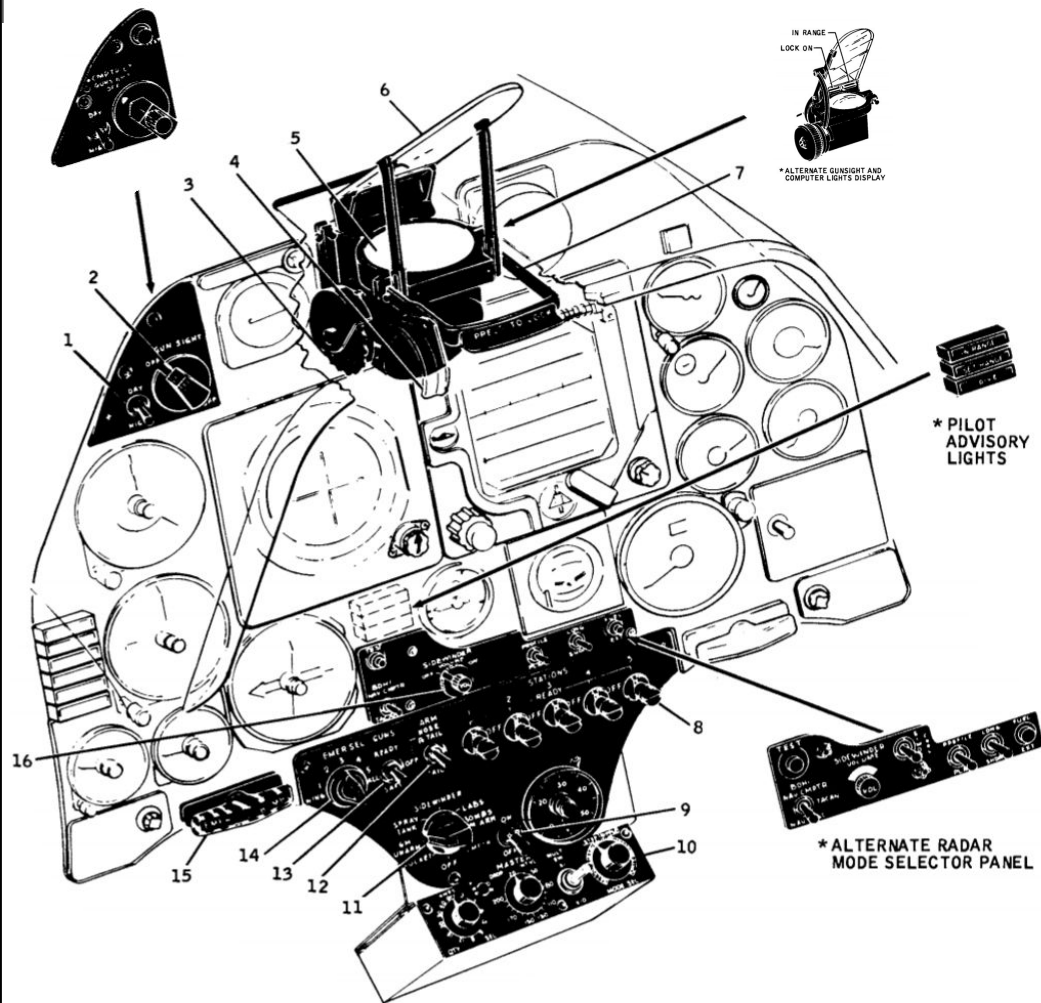


1. Approach Power Compensator
2. Angle-Of-Attack Indexer
3. Wheels (and Flaps) Speed Warning
4. Low Altitude Bombing System
5. Low Altitude Warning System
6. Obstacle Warning
7. Identify-Friend-Foe System
8. Low Oil Warning
9. Fire Warning
10. Radar Altitude Low Limit Warning
11. CP-741/A computer display lights
12. Fuel Boost, Control Hydraulics, Utility Hydraulics, Fuel Transport, Speedbrake and Spoiler warning lights

3. COCKPIT AND GAUGES



3. COCKPIT AND GAUGES

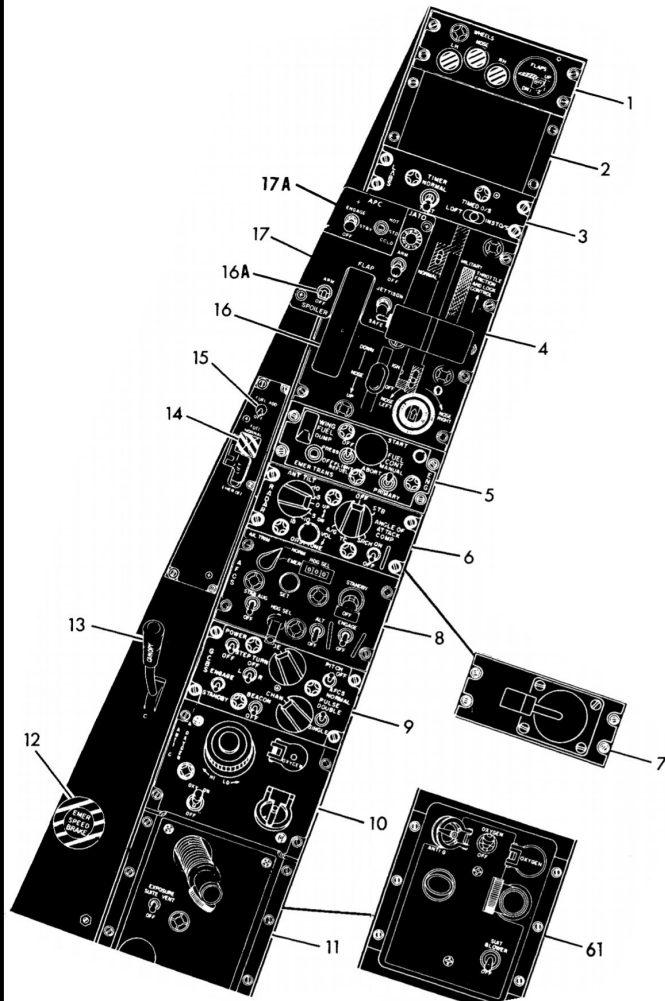


1. GUNSIGHT DAY-NIGHT SWITCH
2. GUNSIGHT LIGHT CONTROL
3. GUNSIGHT ELEVATION CONTROL
4. ELEVATION CONTROL GUARD
5. GUNSIGHT
6. GUNSIGHT REFLECTION PLATE
7. ELEVATION CONTROL LOCKING YOKE
8. STATIONS SELECT SWITCHES
9. MASTER ARMAMENT SWITCH
10. AWE-1 AIRCRAFT WEAPONS RELEASE SYSTEM PANEL
11. FUNCTION SELECTOR SWITCH (*CMPTR POSITION)
12. BOMB ARMING SWITCH
13. GUNS SWITCH
14. EMERGENCY SELECTOR SWITCH
15. EMERGENCY STORES RELEASE HANDLE
16. SIDEWINDER COOLANT OFF-ON AND VOLUME CONTROL SWITCH

3. COCKPIT AND GAUGES



3. COCKPIT AND GAUGES

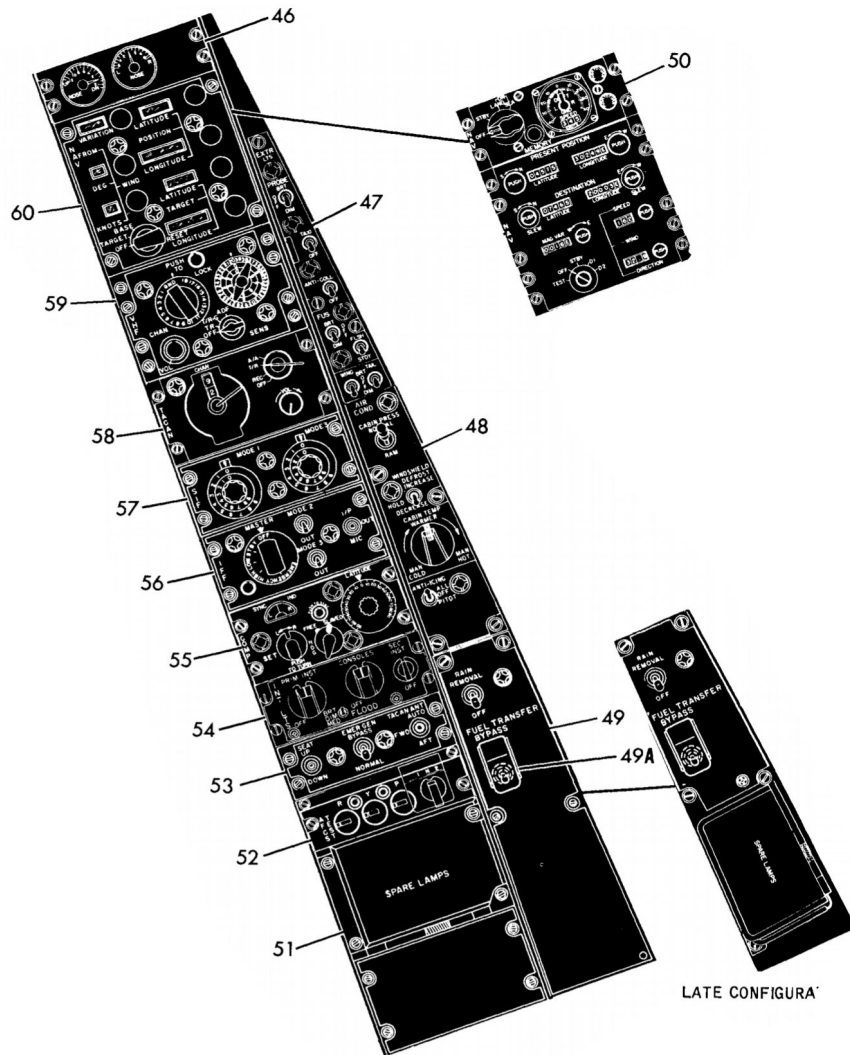


1. WHEELS AND FLAPS PANEL
2. BLANK PANELS (NOT REWORKED PER A-4 AFC 376)
WEAPON CONTROL PANEL (REWORKED PER A-4 AFC 376)
3. LABS CONTROL PANEL (NOT REWORKED PER A-4 AFC 376)
BLANK PANEL (REWORKED PER A-4 AFC 376)
4. THROTTLE PANEL
5. ENGINE CONTROL PANEL
6. RADAR CONTROL PANEL (NOT REWORKED PER A-4 AFC 256
OR REWORKED PER A-4 AFC 387)
7. ARN-77 CONTROL SELECTOR (REWORKED PER A-4 AFC 256)
8. AFCS PANEL
9. GCBS PANEL
10. OXYGEN AND ANTI-G PANEL
11. ANTIEXPOSURE SUIT CONTROL PANEL
12. EMERGENCY SPEEDBRAKE CONTROL
13. CANOPY CONTROL HANDLE
14. MANUAL FUEL SHUTOFF CONTROL LEVER
15. SMOKE ABATEMENT SWITCH
16. FLAP HANDLE
- 16A SPOILER ARM SWITCH
17. JATO CONTROL PANEL
- 17A APPROACH POWER COMPENSATOR CONTROL PANEL
61. OXYGEN, ANTI-G, AND ANTIEXPOSURE SUIT CONTROL
PANEL (REWORKED PER A-4 AFC 387)

3. COCKPIT AND GAUGES



3. COCKPIT AND GAUGES



46. TRIM POSITION INDICATOR PANEL
47. EXTERIOR LIGHTS PANEL
48. AIR CONDITIONING PANEL
49. RAIN REMOVAL PANEL
- 49A FUEL TRANSFER BYPASS SWITCH
50. DOPPLER NAVIGATIONAL COMPUTER (ASN-41)(LATE A-4E)
51. SPARE LAMPS CONTAINER (NOT REWORKED PER A-4 AFC 256)
AFCS TEST SWITCH PANEL (REWORKED PER A-4 AFC 256)
52. AFCS TEST SWITCH PANEL (NOT REWORKED PER AFC 256)
COMPASS CONTROL PANEL (REWORKED PER A-4 AFC 256)
53. MISCELLANEOUS SWITCHES PANEL
54. INTERIOR LIGHTS PANEL (REWORKED PER A-4 AFC 428)
55. COMPASS CONTROL PANEL (NOT REWORKED PER A-4 AFC 256)
IFF CONTROL PANEL (REWORKED PER A-4 AFC 256)
56. IFF CONTROL PANEL (NOT REWORKED PER A-4 AFC 256)
RADAR CONTROL PANEL (REWORKED PER A-4 AFC 256)
AN/APR-25 (V) CONTROL PANEL (REWORKED PER A-4 AFC 394)
57. SIF CONTROL PANEL
58. TACAN CONTROL PANEL
59. UHF CONTROL PANEL
60. NAV CONTROL PANEL (ASN-19, EARLY A-4E)

LATE CONFIGURATION

Startup Procedure

1. Contact Ground Crew -
Ground Power On (\ > F8
>F2 > F1)
2. Press Start Button
3. When Throttle RPM
reaches 5%, move throttle
to start (right click)
4. When throttle RPM reaches
15%, move throttle to idle
(right click again)
5. When Throttle RPM
reaches 40%, turn off
ground power (\ > F8 > F2
> F2)

Ready To Taxi!

(Avoid fast taxi as carrier
script can kick in at around
4 kts, causing a runaway
taxi! Use your brakes)



1

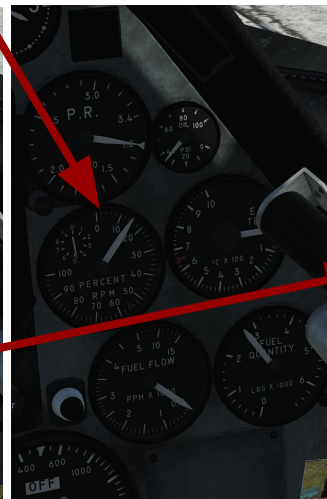
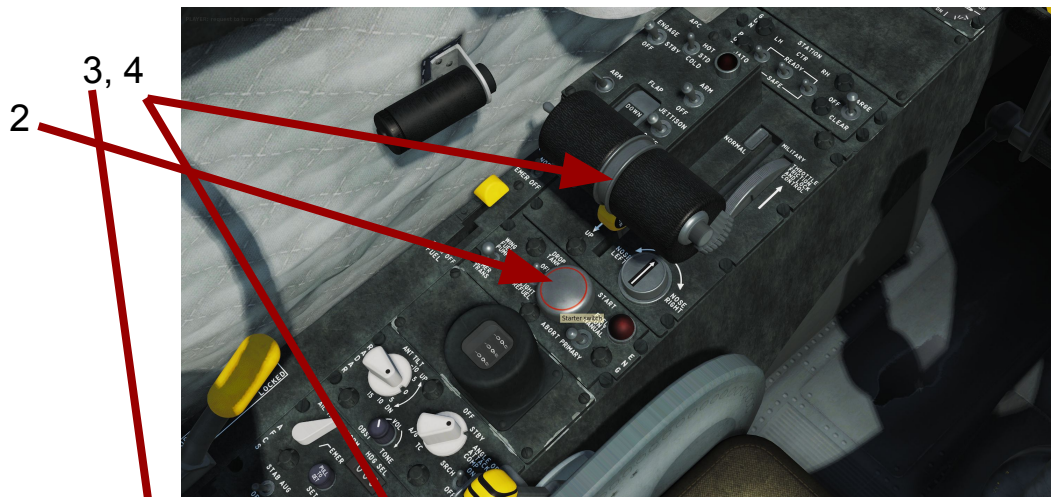
4. STARTUP

Startup Procedure

1. Contact Ground Crew - Ground Power On (\ > F8 > F2 > F1)
2. Press Start Button
3. When Throttle RPM reaches 5%, move throttle to start (right click)
4. When throttle RPM reaches 15%, move throttle to idle (right click again)
5. When Throttle RPM reaches 40%, turn off ground power (\ > F8 > F2 > F2)

Ready To Taxi!

(Avoid fast taxi as carrier script can kick in at around 4 kts, causing a runaway taxi! Use your brakes)



Nav Setup Procedure : AN/ASN - 41

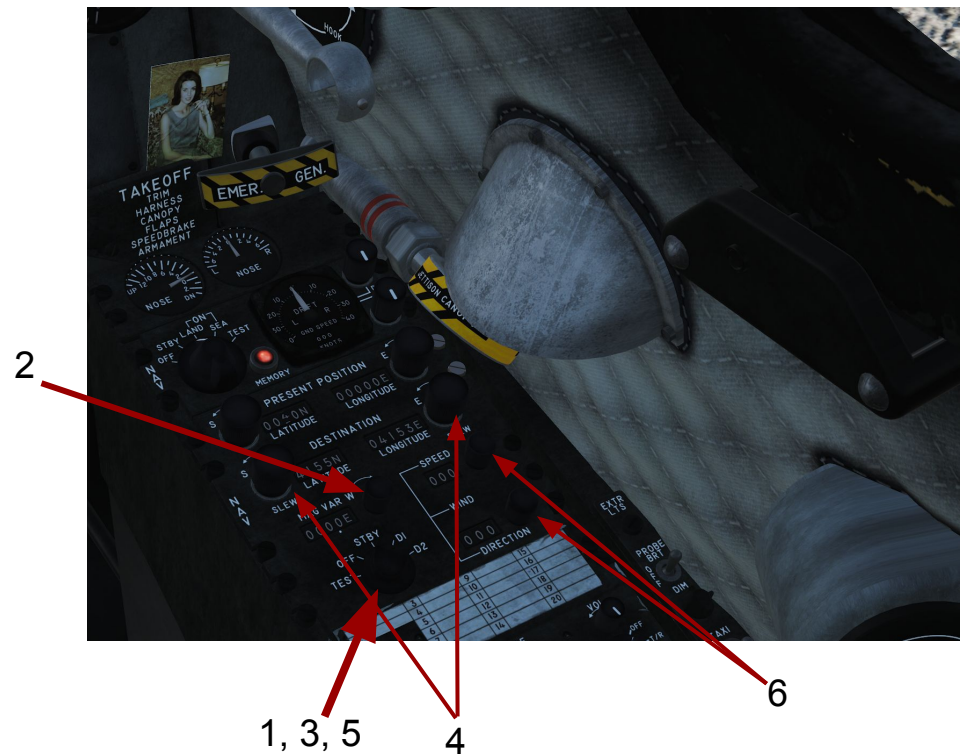
1. Set AN/ANS-41 DNS waypoint selector to STBY and wait 5 mins
2. Set magnetic var (6°E for Caucasus, 12°E for NTTR, 8°E for Normandy, 1.6°E for Persian Gulf)

To save waypoints:

3. Set waypoint selector to D2 (present position will be set, and set as D1 and D2 when dial moved off STBY)
4. Set waypoint coordinates via dials
5. Repeat for D1

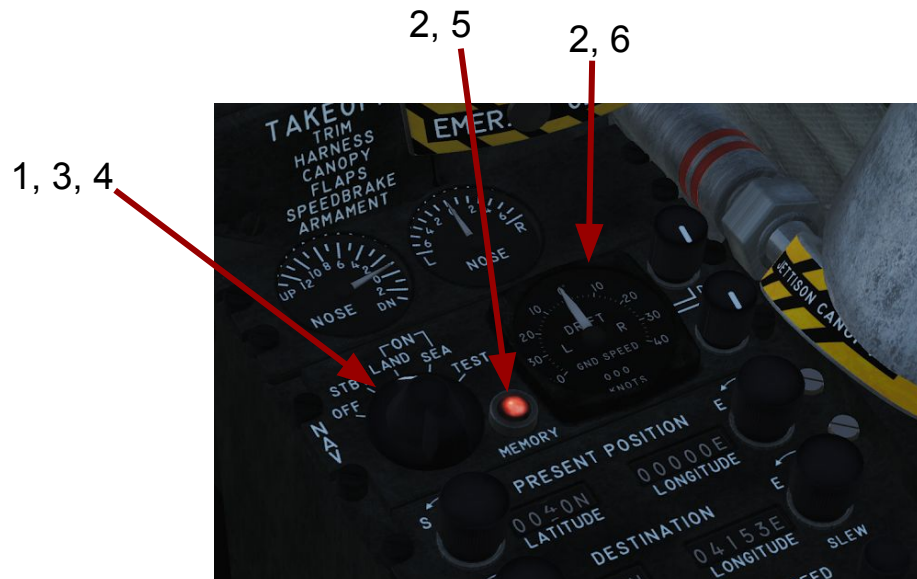
(Optional)

6. Set wind speed and direction (will be set automatically if using with AN/APN-153 radar)



Nav Setup Procedure : AN/APN-153

1. Set AN/APN-153 Doppler Radar Set to TEST and wait 5 min. (DO NOT DO before power on)
2. After warm up time memory light should extinguish and groundspeed dial should read 121 ± 5 kts, drift angle should read 0 ± 2 degrees
3. Turn to STBY
4. Prior to takeoff set selector switch knob to ON-LAND or ON-SEA as appropriate
5. Approximately 30 seconds after aircraft has reached 150 kts and 40 ft of altitude, the memory light should extinguish
6. After cruise altitude is attained, ground speed and drift should read within ± 50 kts and ± 10 degrees respectively for known conditions of flight



During flight:

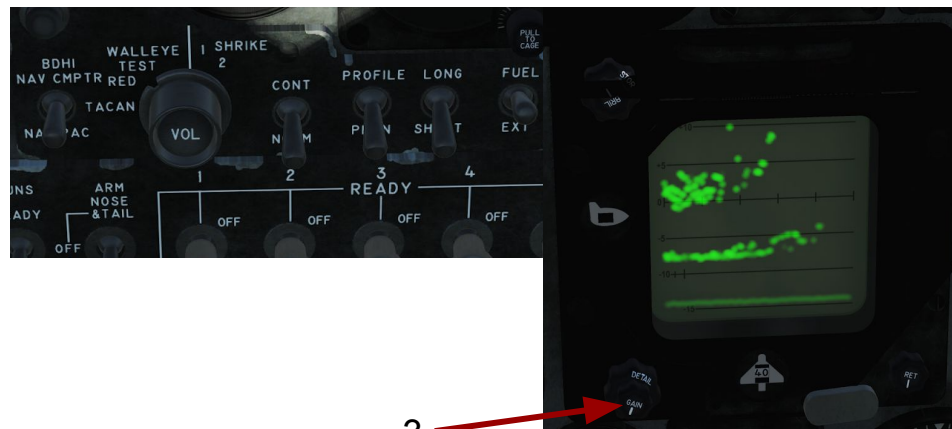
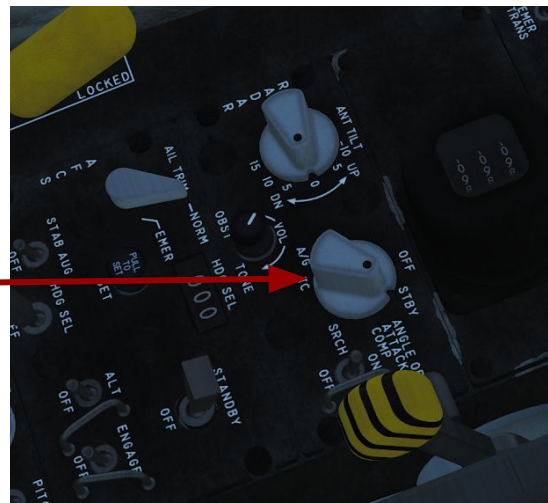
Bank and turns should be limited to 30 degrees left or right/type of terrain being flown over, or memory light will ignite, indicating loss of tracking.

Climbs and descent should be limited to 25 degrees as this is near operating limits. Memory light may ignite for no more than 3 seconds.

Radar Setup Procedure : AN/APG-53A

1. Mode Selector Switch to STBY and allow 3 mins for warm up
2. Mode Selector Switch to SRCH
3. Turn Gain Control Knob Clockwise until targets appear
4. Position Range Switch to SHORT - Confirm flag indicates 20 miles
5. Mode Selector Switch to T/C - Confirm flag indicates 10 miles, tilt control should zero.
6. Turn Gain Control Knob clockwise until targets appear to be 5 degrees in vertical dimension
7. Turn Detail Knob clockwise until targets are reduced to 1 degree in vertical dimension.
8. Observe terrain clearance line on scope. Position Range selector switch to LONG - Confirm terrain clearance line moves to the left and slightly up
9. Position Mode Selector Switch to A/G and confirm horizontal line sweeps from top to near bottom
10. Position Mode Selector Switch to OFF

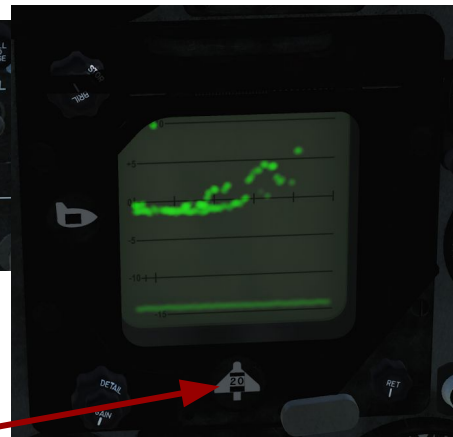
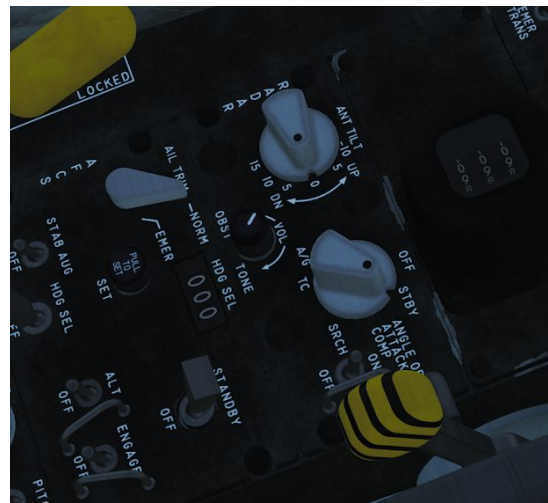
1, 2



3

Radar Setup Procedure : AN/APG-53A

1. Mode Selector Switch to STBY and allow 3 mins for warm up
2. Mode Selector Switch to SRCH
3. Turn Gain Control Knob Clockwise until targets appear
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5. Mode Selector Switch to T/C - Confirm flag indicates 10 miles, tilt control should zero.
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10. Position Mode Selector Switch to OFF



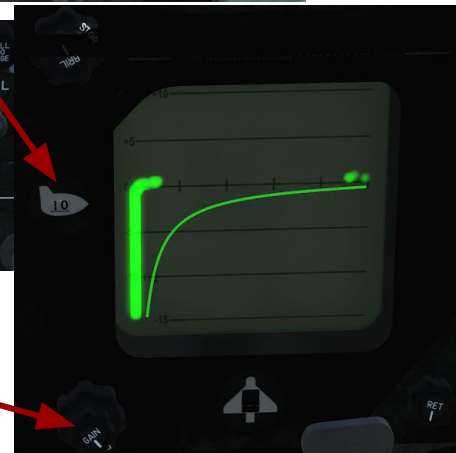
Radar Setup Procedure : AN/APG-53A

1. Mode Selector Switch to STBY and allow 3 mins for warm up
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10. Position Mode Selector Switch to OFF

5



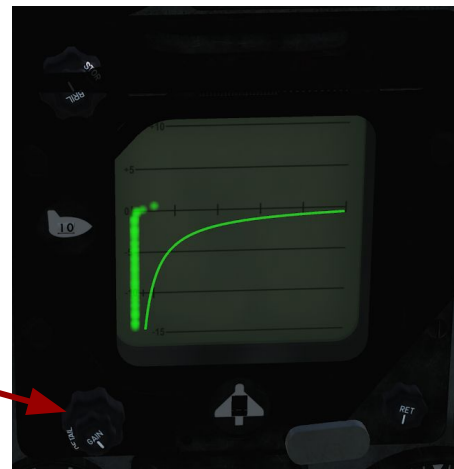
6



Radar Setup Procedure : AN/APG-53A

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2. Mode Selector Switch to SRCH
3. Turn Gain Control Knob Clockwise until targets appear
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5. Mode Selector Switch to T/C - Confirm flag indicates 10 miles, tilt control should zero.
6. Turn Gain Control Knob clockwise until targets appear to be 5 degrees in vertical dimension
7. Turn Detail Knob clockwise until targets are reduced to 1 degree in vertical dimension.
8. Observe terrain clearance line on scope. Position Range selector switch to LONG - Confirm terrain clearance line moves to the left and slightly up
9. Position Mode Selector Switch to A/G and confirm horizontal line sweeps from top to near bottom
10. Position Mode Selector Switch to OFF

7



8



Radar Setup Procedure : AN/APG-53A

1. Mode Selector Switch to STBY and allow 3 mins for warm up
2. Mode Selector Switch to SRCH
3. Turn Gain Control Knob Clockwise until targets appear
4. Position Range Switch to SHORT - Confirm flag indicates 20 miles
5. Mode Selector Switch to T/C - Confirm flag indicates 10 miles, tilt control should zero.
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7. Turn Detail Knob clockwise until targets are reduced to 1 degree in vertical dimension.
8. Observe terrain clearance line on scope. Position Range selector switch to LONG - Confirm terrain clearance line moves to the left and slightly up
9. Position Mode Selector Switch to A/G and confirm horizontal line sweeps from top to near bottom
10. Position Mode Selector Switch to OFF

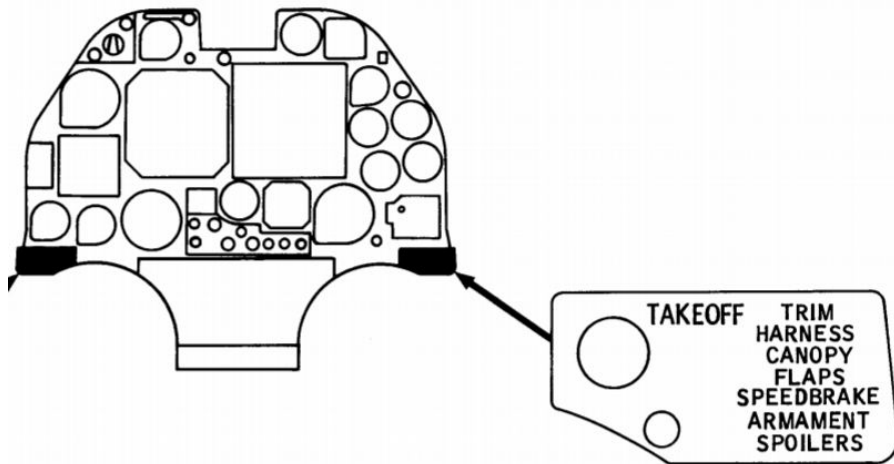


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10

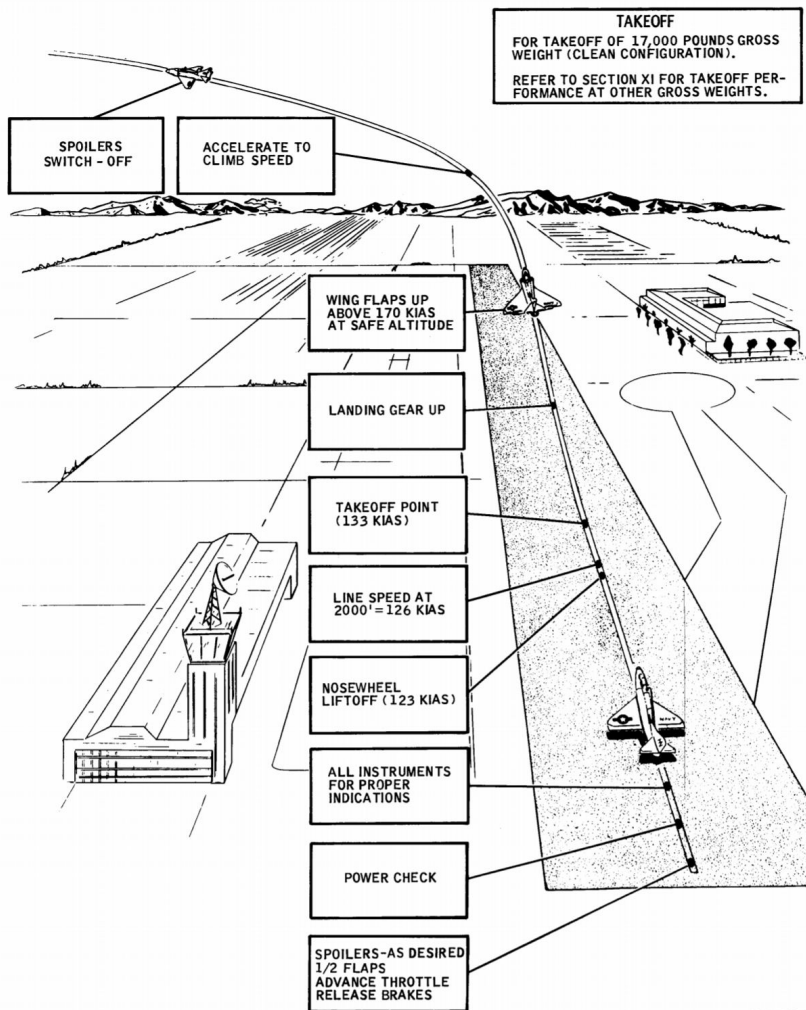




Takeoff Checklist

1. Trim :
 - Aileron: Stick Centered Tab Faired $\pm 1/5$ in
 - Rudder: 0 degrees
 - Elevator (field) 8 Degrees Up
2. Harness
3. Canopy
4. Flaps - Set at $1/2$
5. Speedbrakes - Closed
6. Armament - All Switches off.
Emergency selector switch appropriate setting
7. Spoilers - As desired (If ARMED, closed - power above 70%)

5. TAKEOFF



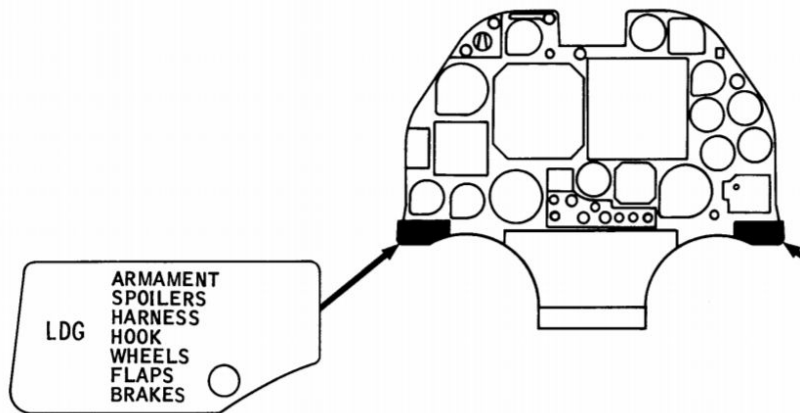
Takeoff

1. Complete Checklist
2. As engine accelerates through 90%, release brakes to avoid skidding tyres.
3. Ensure acceleration is within acceptable limits and engine accelerates smoothly
4. Lift nose-wheel at 123 KIAS
5. Takeoff at 133 KIAS
6. Gear up at 40ft
7. Flaps up at 170 KIAS at safe altitude
8. Once climb speed reached switch spoilers off.

Note:

On rough runways nose-wheel bounce may occur, forward stick pressure should be used to counter this.

6. LANDING



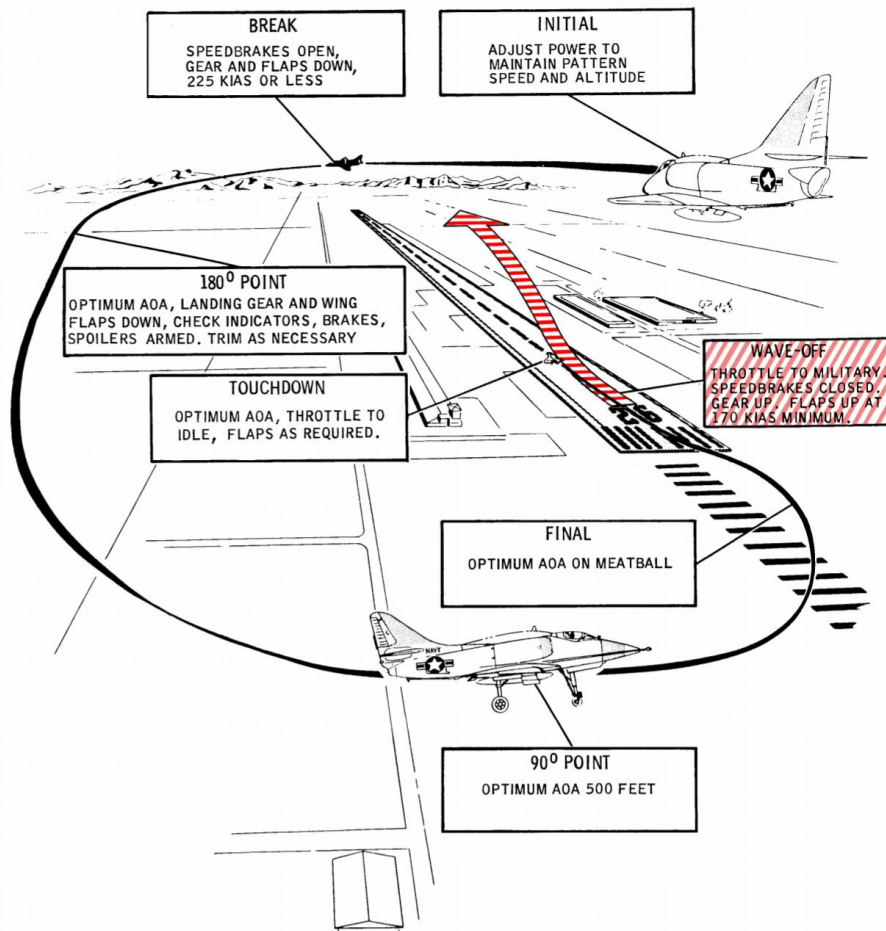
Landing Checklist

1. Armament - All switches off.
Emergency selector switch appropriate setting
2. Spoilers - Off
3. Harness
4. Hook Up (field landing)
5. Wheels - Down
6. Flaps - Full
7. Brakes - Pump before landing, gentle pressure upon landing to avoid skid.

6. LANDING

NOTE

REFER TO LANDING DISTANCE CHARTS
IN SECTION XI FOR FINAL APPROACH
AND TOUCHDOWN SPEEDS.



Landing

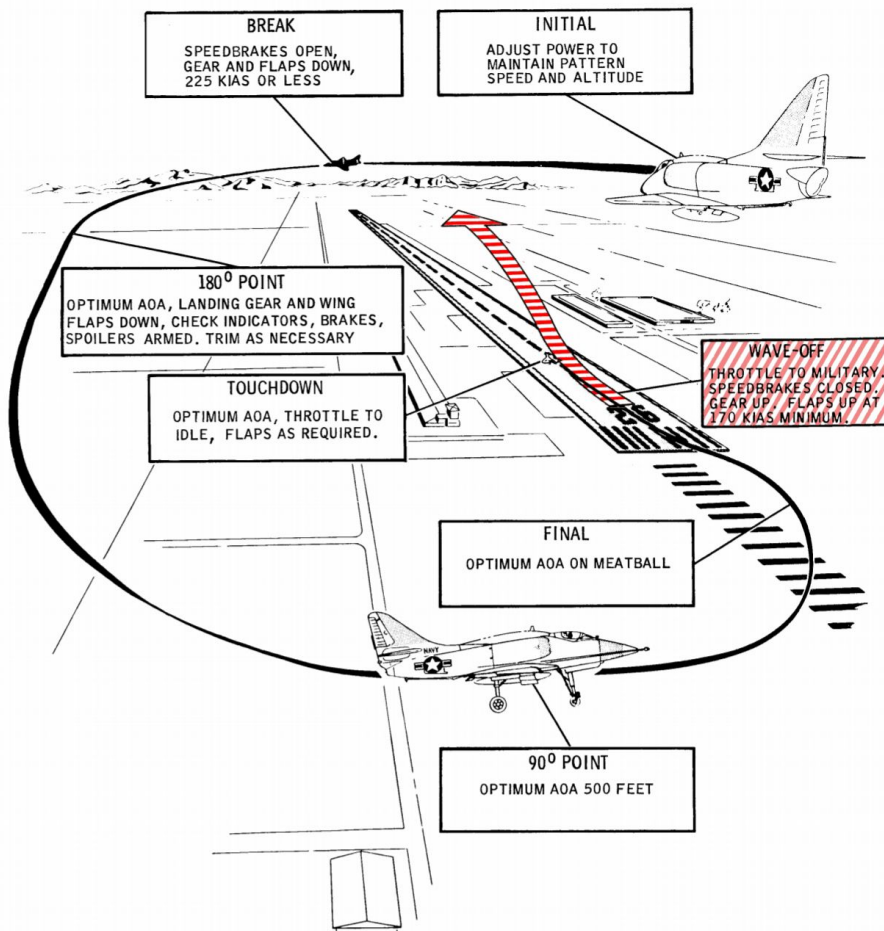
1. After break - Extend speedbrakes and retard throttle to 70% (speedbrakes will remain extended throughout approach and landing)
2. As aircraft decelerates to 225 KIAS or lower, lower landing gear and extend flaps full
3. As aircraft decelerates to 170 KIAS or lower, adjust power to maintain desired airspeed.
4. Complete Checklist
5. Crosscheck airspeed with AOA indexer indication

Note: at gross weight of 14,000 lbs, recommended approach speed is approx 125 KIAS at abeam position. Optimum AOA indication is 17 ½ units. For each 1000 lbs increase over 14,000, optimum approach speed increases approximately 5 KIAS.

6. LANDING

NOTE

REFER TO LANDING DISTANCE CHARTS
IN SECTION XI FOR FINAL APPROACH
AND TOUCHDOWN SPEEDS.

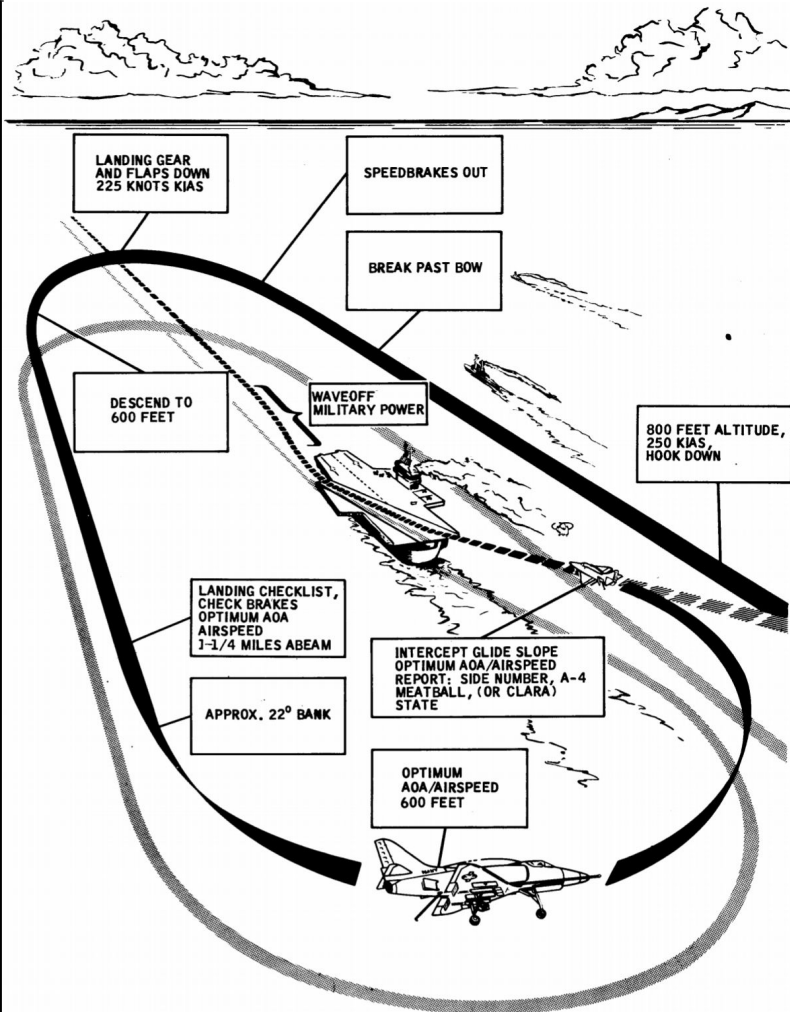


Upon Landing

1. Power to IDLE
2. Flaps as required by conditions
3. Apply full forward stick as necessary to maintain wings level
4. Apply rudder as necessary to maintain control
5. Use brakes as necessary
6. As rudder becomes ineffective, used brakes for directional control

For minimum distance landing:

1. Maintain optimal AOA during approach
2. Upon touchdown let nose fall through and use full forward stick
3. Leave flaps extended unless excessive crosswind
4. Apply moderately heavy braking immediately upon nose-wheel touchdown
5. Maintain steady braking throughout rollout to stop or desired taxi speed, increasing pressure as speed decreases.
6. Landing roll may be reduced by shutting down engine upon touchdown



HH1-89

Carrier Landing

1. Minimum Straight in of 3 miles on starboard side, parallel to Base Recovery Course at 800 ft and 250 KIAS.
2. Break should occur past bow
3. Speedbrakes out at break (may not be desirable at heavy weights)
4. At 225 KIAS or lower, landing gear down and flaps full
5. Descend to 600 ft after break
6. Complete landing checklist and maintain optimum AOA airspeed at 1-1/4 miles abeam
7. Bank at approx 22 degrees
8. Maintain optimum AOA/Airspeed and 600ft altitude on turn-in
9. Intercept glide slope and descend
10. Upon touchdown, advance the throttle to MILITARY and retract the speedbrakes
11. After arrestment is assured, retard the throttle to IDLE and raise the hook and flaps. The aircraft should be allowed to roll back a short distance after arrestment to permit the hook to disengage from the pendant.
12. Hold brakes on carrier or carrier will slide out from underneath you (SFM product)

Figure 3-7. Typical Carrier-Landing Pattern



Low Limit Indexer

Control Knob

AN/APN-141 Radar Altimeter

The AN/APN-141 radar altimeter employs the pulse radar technique to furnish accurate instantaneous altitude information to the pilot from 0 to 5000 feet terrain clearance.

Aircraft height is determined by measuring the elapsed transit time of a radar pulse, which is converted directly to altitude in feet and displayed on the cockpit indicator.

The indicator dial face is marked in 10-foot increments up to 200 feet, 50-foot increments from 200 to 600 feet, 100-foot increments from 600 to 2000 feet, and 500-foot increments from 2000 to 5000 feet.

A control knob on the front of the indicator controls power to the indicator and is used for setting the low-limit indexer





AN/APN-141 Radar Altimeter

An OFF flag on the indicator face appears when signal strength becomes inadequate to provide reliable altitude information, when power to the system is lost, or when the system is turned OFF.

At altitudes above 5000 feet terrain clearance, the OFF flag will appear and the pointer will move behind the masked portion of the indicator dial. The pointer will resume normal operation when the aircraft descends below 5000 feet.

The radar altimeter operates normally during 50-degree angles of climb or dive and 30-degree angles of bank, right or left. Beyond these points, the indications on the radar altimeter become unreliable but will resume normal operation when the aircraft returns to normal flight.





Warning
Lights

Low Altitude Warning System

The low altitude warning system is used to warn the pilot of impending danger due to low altitude.

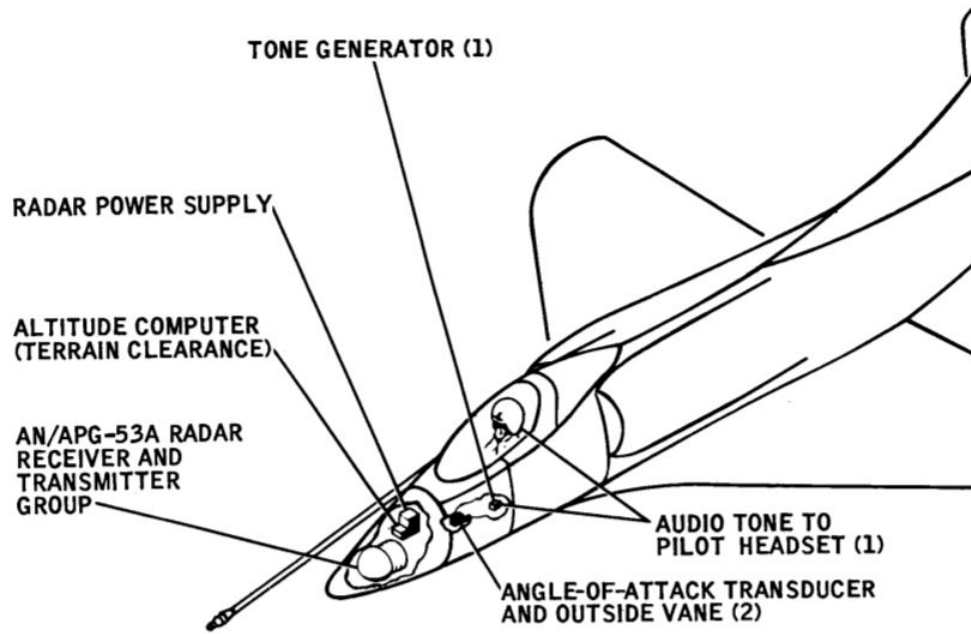
The warning system consists of two warning lights and an aural warning tone heard in the pilot's headset that operates in conjunction with the AN/APN-141 radar altimeter.

One warning light is located under the glareshield, and the other, which is the radar low limit warning light, is located adjacent to the radar altimeter.

When the AN/APN-141 radar altimeter indicator pointer drops below the preset low-limit indexer altitude setting, both warning lights come on and the aural warning tone is activated for 2 seconds.

The warning tone is an alternating 700- to 1700-cps tone with a repetition rate of 2 cps.

In addition, a reliability warning signal sounds for 2 seconds when the radar altimeter acquires or loses its lock-on. The reliability warning signal has the same frequency range but a repetition rate of 8 cps.



AN/APG-53A Radar System

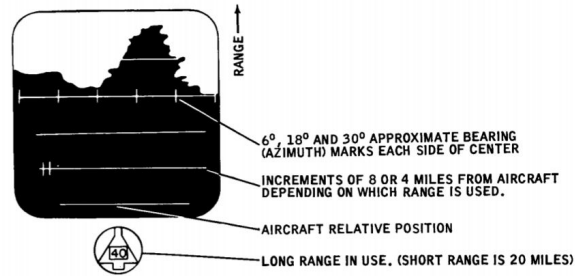
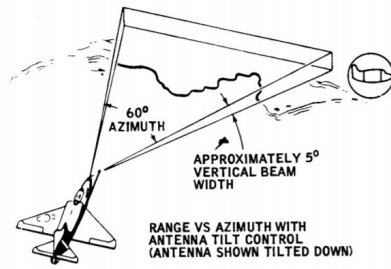
The ANI APG- 53A radar system provides the pilot with search or mapping capabilities for navigational purposes, two modes of terrain clearance for obstacle avoidance in either the azimuth or elevation plane, and air-to-ground slant range for weapons delivery.

Automatic fire control is not provided.

Operating controls are provided on the radar control panel located on the right-hand console, on a small radar switch panel installed near the center of the bottom edge of the instrument panel, and around the perimeter of the azimuth-elevation-range indicator (scope) mounted in the instrument panel

Four modes of operation are available for pilot selection; standby, search, terrain clearance, and slant range. In search mode the B scope presentation is utilized, in terrain clearance mode B scope presentation is used for PLAN and E scope presentation is used for PROFILE, while slant range mode is presented as a vertical sweep range bar.

SEARCH MODE



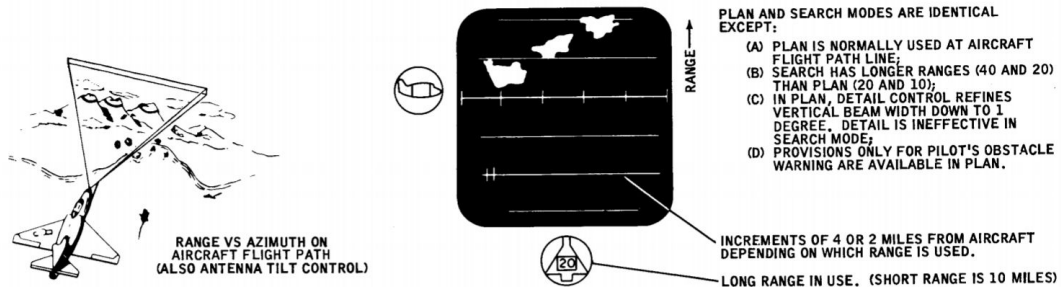
AN/APG-53A Radar System

The search mode presentation displays range versus azimuth. Either 0- to 20-mile range or 0- to 40-mile range in nautical miles may be selected.

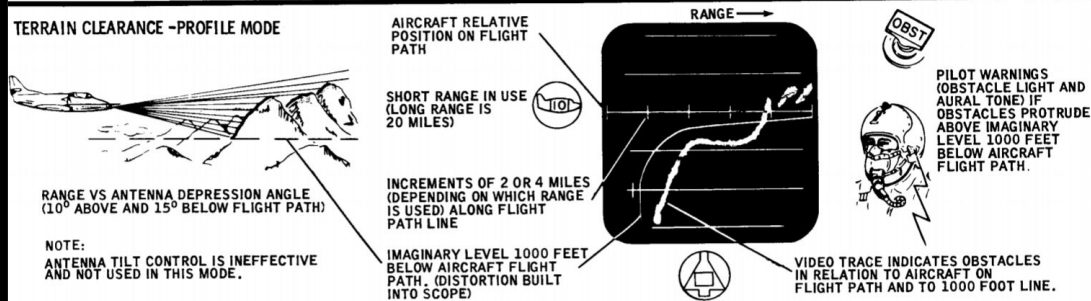
The range in use is shown by a flag-type marker in the plan-view aircraft at the bottom of the scope. The indicator face is divided by horizontal lines, each representing one-fifth of the total range. This gives a calibration line every 8 miles for LONG and 4 miles for SHORT.

In SRCH, the radar antenna is programmed to sweep 60 degrees in azimuth using a 5 degree cone of radiation at the elevation angle (antenna tilt) selected by the pilot. Vertical marks on the zero elevation line of the reticle show the approximate bearing to any point on the display. The marks represent 6, 18, and 30 degrees each side of center. The antenna elevation is set by the pilot and may be varied from 10 degrees above to 15 degrees below the flight path (angle-of-attack switch ON).

TERRAIN CLEARANCE-PLAN MODE



TERRAIN CLEARANCE -PROFILE MODE



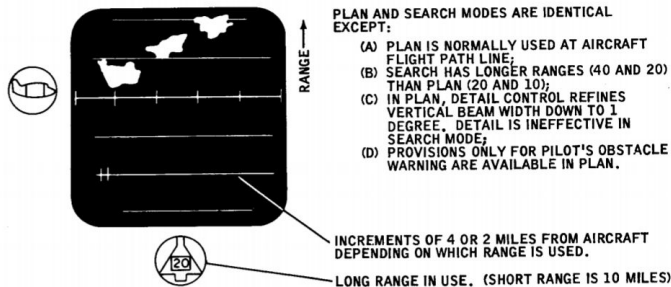
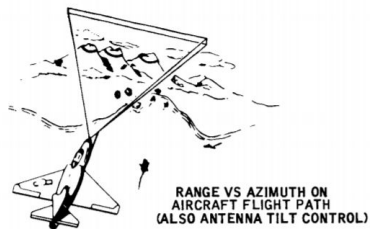
AN/APG-53A Radar System

TERRAIN CLEARANCE - PLAN MODE

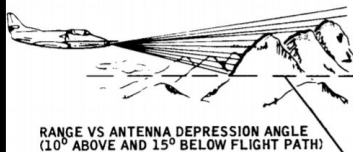
With the profile-plan switch in the PLAN position, the rotary mode selector switch in the TIC position, and the angle-of-attack switch ON, the indicator (scope) provides a B-scope (range-versus-azimuth) presentation of obstacles in the projected flight path of the aircraft. The terrain clearance PLAN display is provided to enable the pilot to maneuver around obstacles rather than over them. Azimuth scan is 60 degrees using a beam width of 5 degrees and a vertical beam width effectively reduced to 1 degree by means of the detail control on the scope.

The vertical width of the beam is determined by the setting of the detail knob. With the knob fully counterclockwise, beam width is approximately 5 degrees; fully clockwise, beam width approximates 1/2 of 1 degree. The scope will display only those obstacles that are within the beam. If the antenna tilt control is at zero degrees and the angle-of-attack switch is in ON, the objects shown will be in a plane that contains the projected flight path and is parallel to the lateral axis of the aircraft. With the angle-of-attack switch OFF, the objects will be in the plane of the armament datum line. Only radar return from the near slope of mountains is received so the presentation is usually patchy

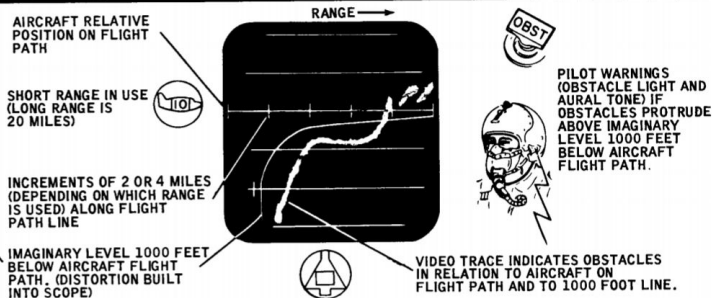
TERRAIN CLEARANCE-PLAN MODE



TERRAIN CLEARANCE -PROFILE MODE



NOTE:
ANTENNA TILT CONTROL IS INEFFECTIVE AND NOT USED IN THIS MODE.



AN/APG-53A Radar System

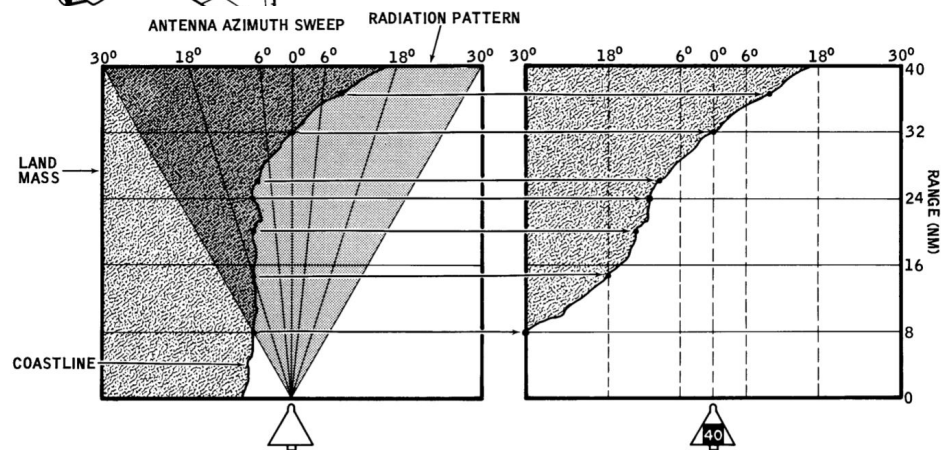
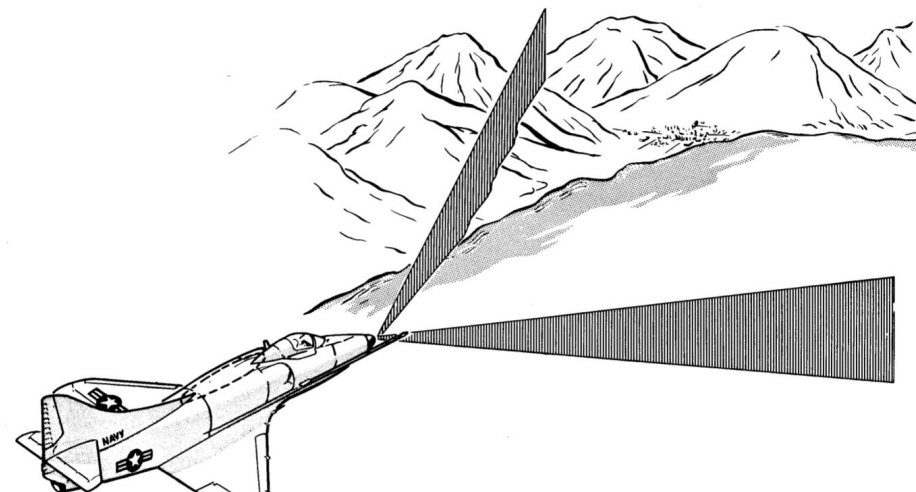
TERRAIN CLEARANCE - PLAN MODE

The pilot may examine terrain above or below the flight path (or ADL) by manually adjusting the tilt control to the desired setting (from plus 10 degrees to minus 15 degrees). However, the tilt control knob is spring loaded in the TIC modes and will return to zero when released. Available for selection are ranges of 0 to 20 or 0 to 10 nautical miles (LONG or SHORT). The range in use is indicated by a flag-type marker in the plan-view aircraft at the bottom of the scope as in SRCH mode.

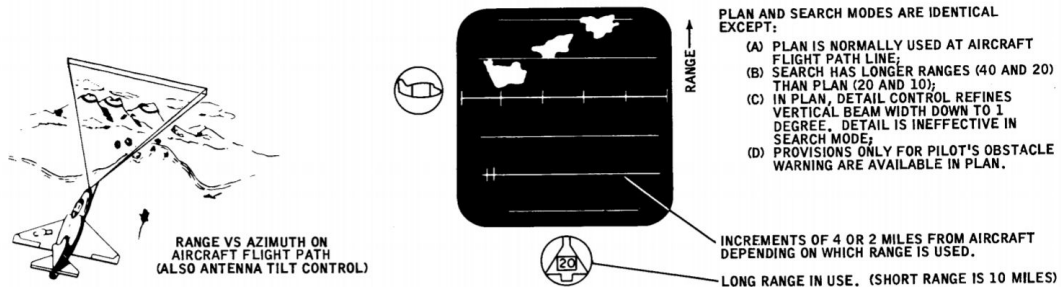
The horizontal lines on the indicator face each represent one-fifth of the total range, giving 4 miles in LONG and 2 miles in SHORT.

Azimuth markings are identical to search mode; 6, 18, and 30 degrees to the left or right of the aircraft heading.

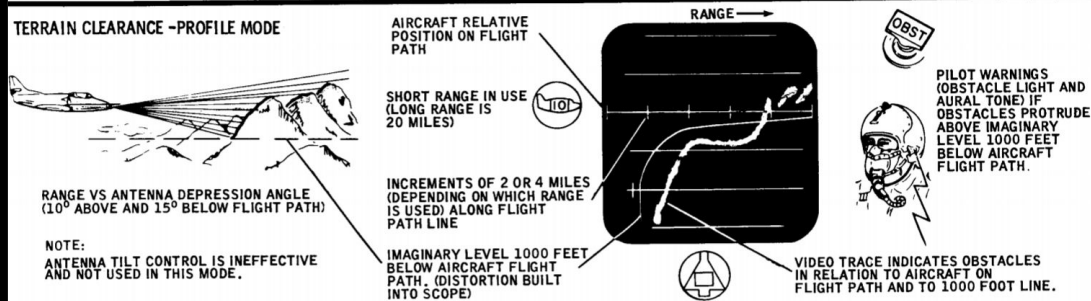
Terrain Clearance - Plan Mode



TERRAIN CLEARANCE-PLAN MODE



TERRAIN CLEARANCE -PROFILE MODE



AN/APG-53A Radar System

TERRAIN CLEARANCE - PROFILE MODE

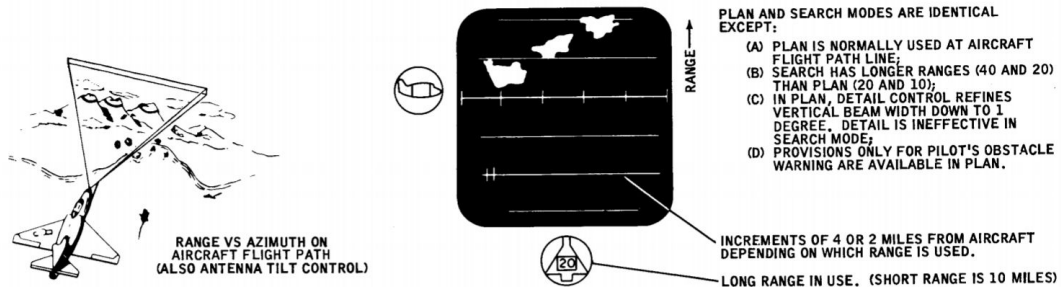
With the presentation switch at PROFILE, the indicator (scope) provides an E-scope (range versus antenna depression angle) display of the terrain profile ahead of the aircraft.

The radar beam automatically locks in azimuth and sweeps in elevation from plus 10 degrees to minus 15 degrees using a beam width of 5 degrees and a vertical beam width effectively reduced to 1 degree by means of the detail control on the scope.

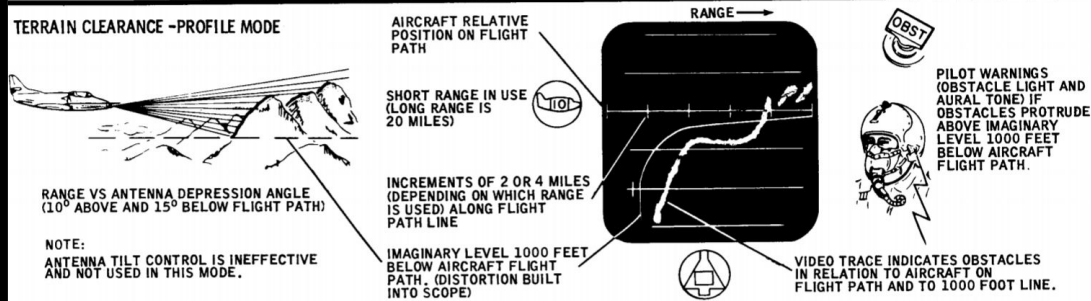
The elevation zero is normally referenced to the flight line by including an angle-of-attack correction in the servo loop. This provides for an extended antenna sweep up to a maximum of plus 11 degrees to minus 19 degrees from the armament datum line (antenna sweep limits).

The antenna tilt control does not function in this mode .

TERRAIN CLEARANCE-PLAN MODE



TERRAIN CLEARANCE -PROFILE MODE



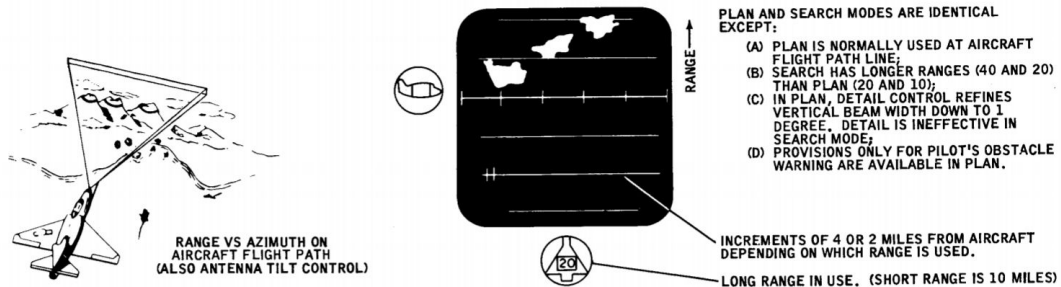
AN/APG-53A Radar System

TERRAIN CLEARANCE - PROFILE MODE

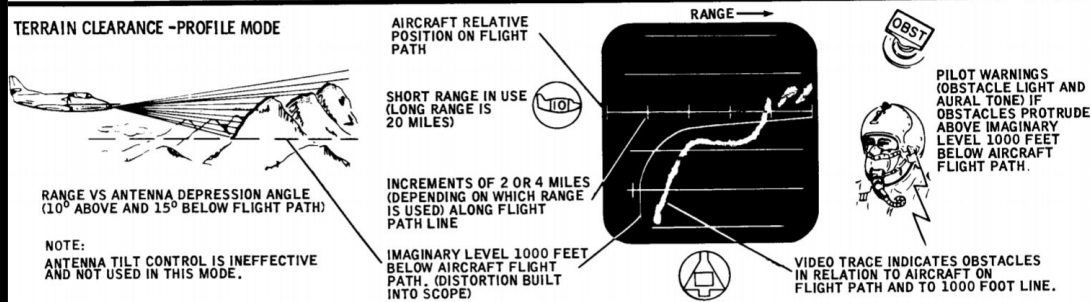
The LONG-SHORT range switch provides either 20- or 10-mile ranges for sufficient detail under various conditions. Vertical marks on the horizontal zero-degree elevation line divide the display into 2- or 4-mile segments according to the range in use. A flag-type marker in the aircraft silhouette at the left of the scope shows which range is in use.

A solid line representing an imaginary plane 1000 feet below the antenna zero-degree elevation line is electronically displayed on the indicator as an aid to low level navigation. This is the terrain clearance scribe line (see figure 1-20) and is synchronized with the elevation sweep. The zero-degree elevation line of the indicator reticle represents the instantaneous forward projection of the aircraft flight or armament datum line depending on the position of the angle-of-attack switch. Since the vertical calibration is in degrees of antenna depression angle rather than in feet of altitude, the resulting expansion of the conical radiation pattern into a rectangular display causes the 1000-foot marker and radar target return to curve downward at the low range end of the indicator. (See diagram later)

TERRAIN CLEARANCE-PLAN MODE



TERRAIN CLEARANCE -PROFILE MODE



AN/APG-53A Radar System

TERRAIN CLEARANCE - PROFILE MODE

An irregular line display is the radar return.

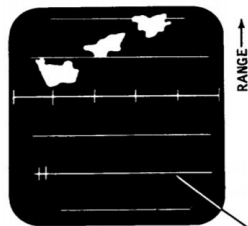
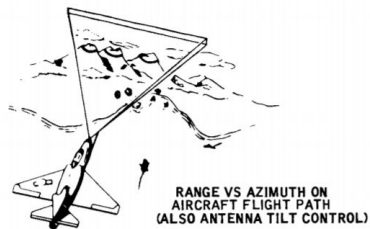
Assuming level terrain and by flying so that the radar return presentation is parallel to the 1000-foot marker, it is possible to fly at a constant altitude above level terrain.

The PROFILE function also incorporates both visual and aural warning to the pilot when obstacles protrude above a horizontal plane positioned 1000-feet below and parallel to the antenna zero-degree reference plane.

The obstacle alarm consists of both the obstacle light and the pilot's headset signal, warning the pilot that a potential hazard exists.

The alarm is controlled by the same circuits that control the 1000-foot terrain clearance scribe line and warns if any obstacle appears above it. A rough indication of the range to the target is provided by the percentage of time that the alarm is actuated. Targets near maximum range will give short blinks and as the target comes closer, the light will remain on for longer periods.

TERRAIN CLEARANCE-PLAN MODE



PLAN AND SEARCH MODES ARE IDENTICAL EXCEPT:

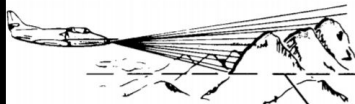
- (A) PLAN IS NORMALLY USED AT AIRCRAFT FLIGHT PATH LINE;
- (B) SEARCH HAS LONGER RANGES (40 AND 20) THAN PLAN (20 AND 10);
- (C) IN PLAN, DETAIL CONTROL REFINES VERTICAL BEAM WIDTH DOWN TO 1 DEGREE. DETAIL IS INEFFECTIVE IN SEARCH MODE;
- (D) PROVISIONS ONLY FOR PILOT'S OBSTACLE WARNING ARE AVAILABLE IN PLAN.



INCREMENTS OF 4 OR 2 MILES FROM AIRCRAFT DEPENDING ON WHICH RANGE IS USED.

LONG RANGE IN USE. (SHORT RANGE IS 10 MILES)

TERRAIN CLEARANCE -PROFILE MODE



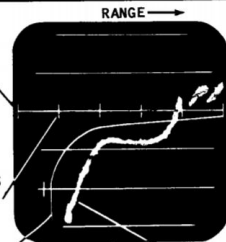
NOTE:
ANTENNA TILT CONTROL IS INEFFECTIVE AND NOT USED IN THIS MODE.

AIRCRAFT RELATIVE POSITION ON FLIGHT PATH

SHORT RANGE IN USE (LONG RANGE IS 20 MILES)

INCREMENTS OF 2 OR 4 MILES (DEPENDING ON WHICH RANGE IS USED) ALONG FLIGHT PATH LINE

IMAGINARY LEVEL 1000 FEET BELOW AIRCRAFT FLIGHT PATH. (DISTORTION BUILT INTO SCOPE)



VIDEO TRACE INDICATES OBSTACLES IN RELATION TO AIRCRAFT ON FLIGHT PATH AND TO 1000 FOOT LINE.



PILOT WARNINGS (OBSTACLE LIGHT AND AURAL TONE) IF OBSTACLES PROTRUDE ABOVE IMAGINARY LEVEL 1000 FEET BELOW AIRCRAFT FLIGHT PATH.



AN/APG-53A Radar System

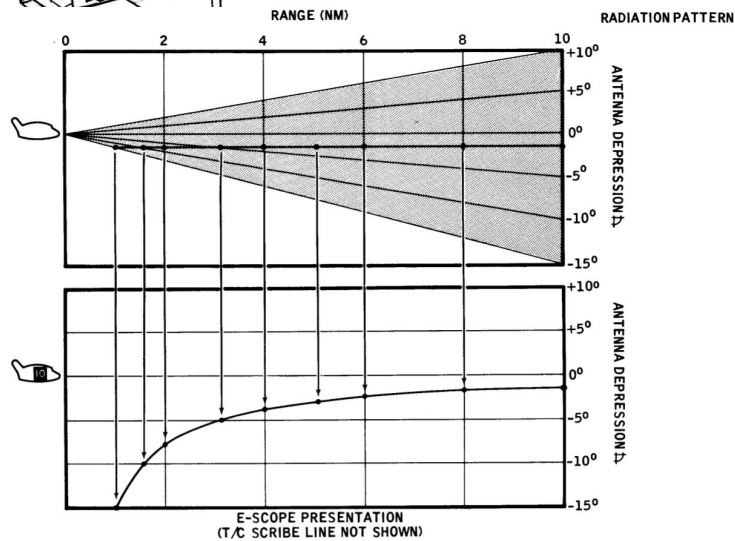
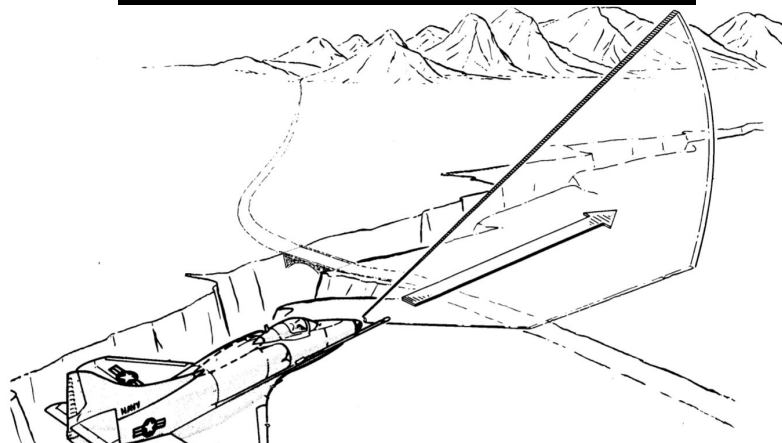
TERRAIN CLEARANCE - PROFILE MODE

The PROFILE display also provides an aid to letdown under conditions of reduced visibility.

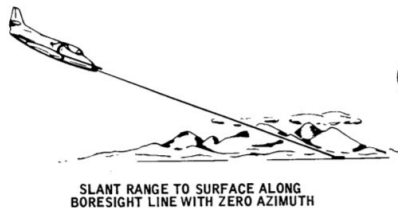
The letdown is accomplished simply by descending at the desired schedule until the radar return intersects the 1000-foot terrain clearance scribe line at a range of 5 miles when operating on LONG range.

The dive angle is then continuously readjusted to maintain the intersection of radar return and T/C scribe line at 5 miles. This results in a gradual reduction in dive angle (and rate of descent) until in straight and level flight 1000 feet above the terrain.

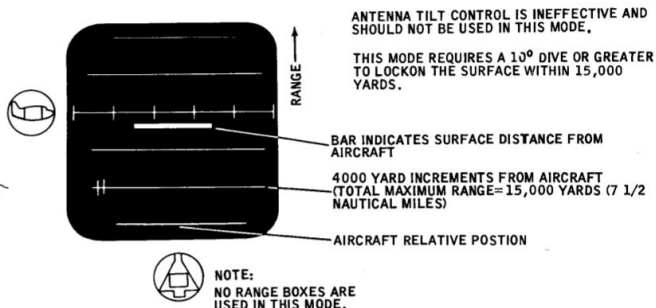
Terrain Clearance - Profile Mode



AIR-TO-GROUND RANGING MODE



NOTE:
AN/APG-53A ILLUSTRATED. AN/APG-53B
PRESENTATION IS SIMILAR.



GG1-42

Figure 1-19. Radar Scope Presentations

AN/APG-53A Radar System

AIR-TO-GROUND MODE

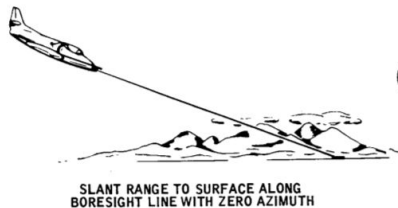
With the mode selector switch in the A/ G position, the indicator (scope) shows the distance to the ground dead ahead.

The antenna is automatically fixed in the azimuth zero position and is parallel to the armament datum line in the elevation coordinate. When the antenna bore sight line and the sight line are made parallel (zero mil lead), the range indication will show the distance to the point on the ground at which the sight is aimed.

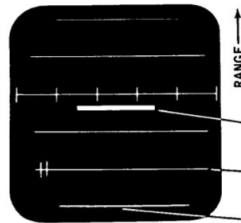
The angle between the ground and the antenna boresight line should be at least 10 degrees to provide adequate radar return for ranging lock-on

. If the distance to the ground exceeds the radar lockon range, the horizontal line will search from the top of the scope to the bottom.

AIR-TO-GROUND RANGING MODE



NOTE:
AN/APG-53A ILLUSTRATED. AN/APG-53B
PRESENTATION IS SIMILAR.



NOTE:
NO RANGE BOXES ARE
USED IN THIS MODE.

ANTENNA TILT CONTROL IS INEFFECTIVE AND
SHOULD NOT BE USED IN THIS MODE.
THIS MODE REQUIRES A 10° DIVE OR GREATER
TO LOCKON THE SURFACE WITHIN 15,000
YARDS.

BAR INDICATES SURFACE DISTANCE FROM
AIRCRAFT
4000 YARD INCREMENTS FROM AIRCRAFT
(TOTAL MAXIMUM RANGE=15,000 YARDS (7 1/2
NAUTICAL MILES)
AIRCRAFT RELATIVE POSITION

GG1-42

Figure 1-19. Radar Scope Presentations

AN/APG-53A Radar System

AIR-TO-GROUND MODE

When ground lock-on occurs the line will stop cycling and, as the slant range decreases, the bar will move downward.

The solid horizontal bar gives the pilot the approximate slant range in yards. The total maximum range in A/G mode is 15,000 yards (approximately 7 1/2 nautical miles). The aircraft relative position is at the bottom line on the scope (minus 15 degree elevation line).

After range lock-on of the horizontal bar, slant range can be read by reference to the horizontal lines etched on the reticle each of which represents a range increment of 4000 yards.



Approach Power Compensator

The APC controls the fuel control and is designed to maintain the optimum angle of attack of 17.5 units resulting in an optimum approach speed on the glide slope and during normal maneuvers in the landing pattern at any landing gross weight.

The APC is designed to command throttle position between an approximate 70 percent rpm and an approximate military rated thrust (MTR) in response to angle of attack.

The angle-of-attack signal is modified by normal acceleration and elevator control stick position. If the APC is engaged or operating when aircraft angles of attack are greater than or less than optimum, the APC will compensate by increasing or decreasing throttle position accordingly.

At angles of attack greater than optimum, the APC will command an increasing throttle position until MRT (approximate) is attained or the angle of attack returns to optimum. Conversely, at angles of attack less than optimum, the APC will command a decreasing throttle position until 70 percent (approximate) rpm is attained or the angle of attack returns to optimum.



Approach Power Compensator

When the APC is in operation (power switch - ENGAGE), the system will disengage if any of the following occurs:

1. Throttle friction is applied.
2. Throttle pOSition is below 70 percent (approximate) rpm.
3. Weight is applied to the main landing gear.

NOTE It is possible to manually hold the APC engaged and override features 1, 2, and 3.

4. An override force of 25 to 30 pounds is applied to the throttles.
5. Power switch is manually returned to STBY position.



Approach Power Compensator

APC POWER SWITCH

The APC power switch, labeled OFF, STBY, and ENGAGE, controls electrical power to the APC system. When the switch is in the OFF position, the APC is de-energized.

Placing the switch in STBY position energizes the APC but does not engage the system.

After the power switch has been positioned in STBY for a minimum of 15 seconds, and the status light (located on the AOA indexer) comes on, the APC will function when the power switch is placed in the ENGAGE position.

TEMPERATURE SWITCH

The air temperature switch, labeled HOT, STD (standard), and COLD, provides a means of compensating for variation in thrust due to outside air temperature changes. The HOT position should be used for temperatures above 80°F (27°C), STD, from 40° = to 80°F (5 to 27°C); and COLD, below 40°F (5°C)



Approach Power Compensator

APC STATUS LIGHT

APC system status is indicated to the pilot by the APC status light attached to the AOA indexer above the instrument glareshield.

The light comes on when the system is in STBY and goes off when the APC is engaged. The light comes on when the system is disengaged and/or is returned to STBY.

Approach Power Compensator Procedure

Normal Procedures for Landing:

1. Complete Landing Checklist
2. Throttle Friction - OFF
3. Air Temperature Switch - SET
4. APC Power Switch - STBY (Observe APC Light ON)
5. APC Power Switch - ENGAGE (Observe APC Light OFF)
6. Throttle - Observe movement
7. Angle-Of-Attack/Airspeed - Cross-Check

After Landing:

1. Throttle - Position as required
2. APC Light - ON
3. APC Power Switch - Check for STBY position.





Approach Power Compensator Technique

The technique required for an APC approach differs from a manual approach in that all glideslope corrections are made by changing aircraft attitude.

Since this technique violates the basic rule that altitude is primarily controlled by the throttle, practice is required to develop the proper control habits and coordination necessary to use APC.

Smooth attitude control is essential for the satisfactory performance of the APC. Large, abrupt attitude changes result in excessive thrust changes. Close-in corrections are very critical. A large attitude correction for a high close-in condition produces an excessive power reduction and can easily result in a hard landing.

If a high close-in situation develops, the recommended procedure is to stop meatball movement and not attempt to recenter the meatball. A low close-in condition is very difficult to safely correct with APC and usually results in an over-the-top bolter. The recommended procedure for a low close-in condition is to override the APC and complete the pass manually. Throughout the approach, the pilot should keep his hand lightly on the throttle in case it becomes necessary to manually override the APC.

8. WEAPONS AND ARMAMENT

Weapons and Armament

The A-4E is a versatile jet, capable of supporting a wide array of air-to-air and air-to-ground munitions across five hard points, including bombs, rockets, missiles and gun-pods

It played a key role in conflicts around the world, including the Vietnam War, the Yom Kippur War and the Falklands War, as well as serving as a training aircraft for the F-14 and an adversarial aircraft for the US Navy.

It was capable of carrying a bomb load equivalent to that of a World War II-era Boeing B-17 bomber



8. WEAPONS AND ARMAMENT

Guns

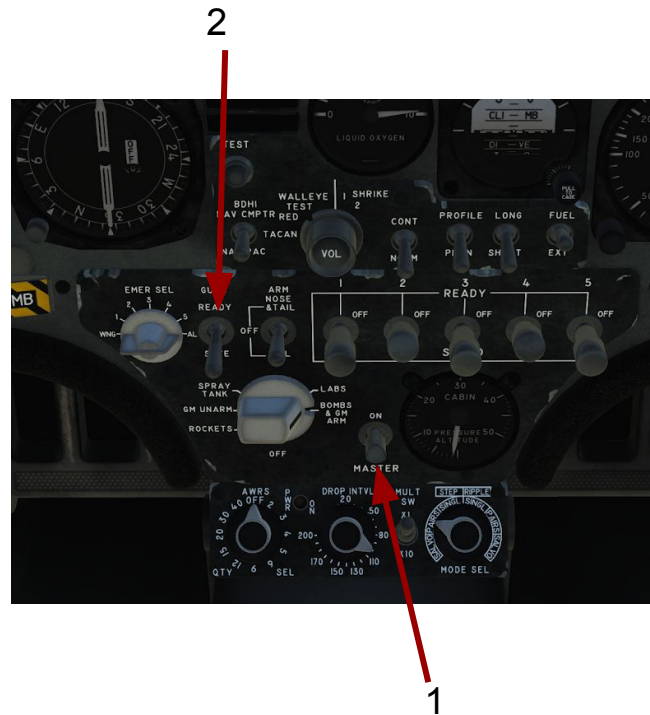
The A-4E has twin 20mm cannons built in and has the option of employing up to 3 MK4 HIPEG 20mm gunpods.



8. WEAPONS AND ARMAMENT

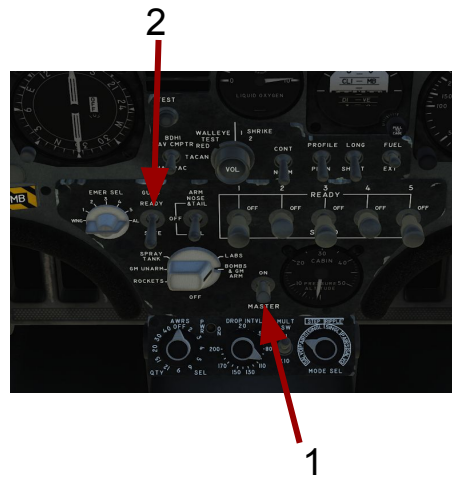
20mm Onboard Cannon

1. Master Arm to ON
2. Set GUNS switch to READY
3. Set gunsight range using dial to side of sight
4. Pull trigger to fire



Mk 4 HIPEG 20mm Cannon Pods

-
- 5



Introduction

Due to the sheer amount of munitions available for the A-4E-C I will be breaking them down by type.

BOMBS

WEAPON	TYPE	WEAPON	TYPE
AN-M30A1	100lb. General Purpose	Mk-77 Mod 0	750lb. Fire bomb
AN-M57A1	250lb. General Purpose	Mk-77 Mod 1	750lb. Fire bomb
AN-M64	500lb. General Purpose	Mk-81	250lb. General Purpose
AN-M65A1	1000lb. General Purpose	Mk-81SE (Snake Eye)	250lb. General Purpose - Retarded
AN-M66A2	2000lb. General Purpose	Mk-82	500lb. General Purpose
AN-M81	260lb. Fragmentation	Mk-82 Snake Eye	500lb. General Purpose - Retarded
AN-M88	220lb. Fragmentation	Mk-83	1000lb. General Purpose
M117	750lb. General Purpose	Mk-84	2000lb. General Purpose
Mk-20 (Rockeye)	Cluster Munition. 247 Dual-Purpose AP shaped charge bomblets		

8. WEAPONS AND ARMAMENT

Bombs

The A-4E carries its weapons on 5 pylons and has a number of deployment methods, which I will cover here.

It is able to release bombs in single, pairs or as a salvo, in step or ripple mode.

That is, it can release bombs individually, as a pair, or in a salvo of any number from 1 to a theoretical maximum of 400.

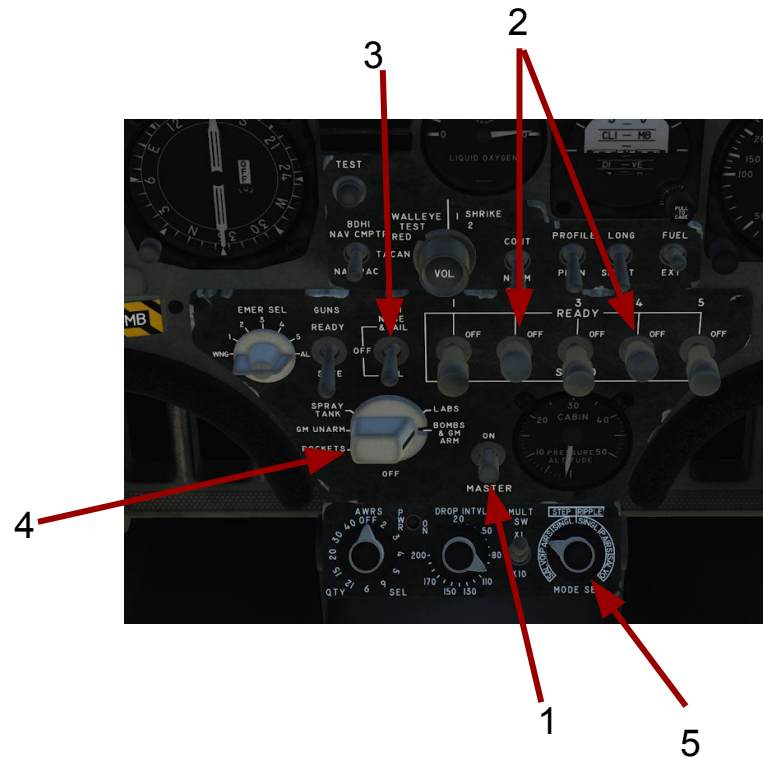
This is all controlled from the panel shown below.



8. WEAPONS AND ARMAMENT

Bombs - Step Release

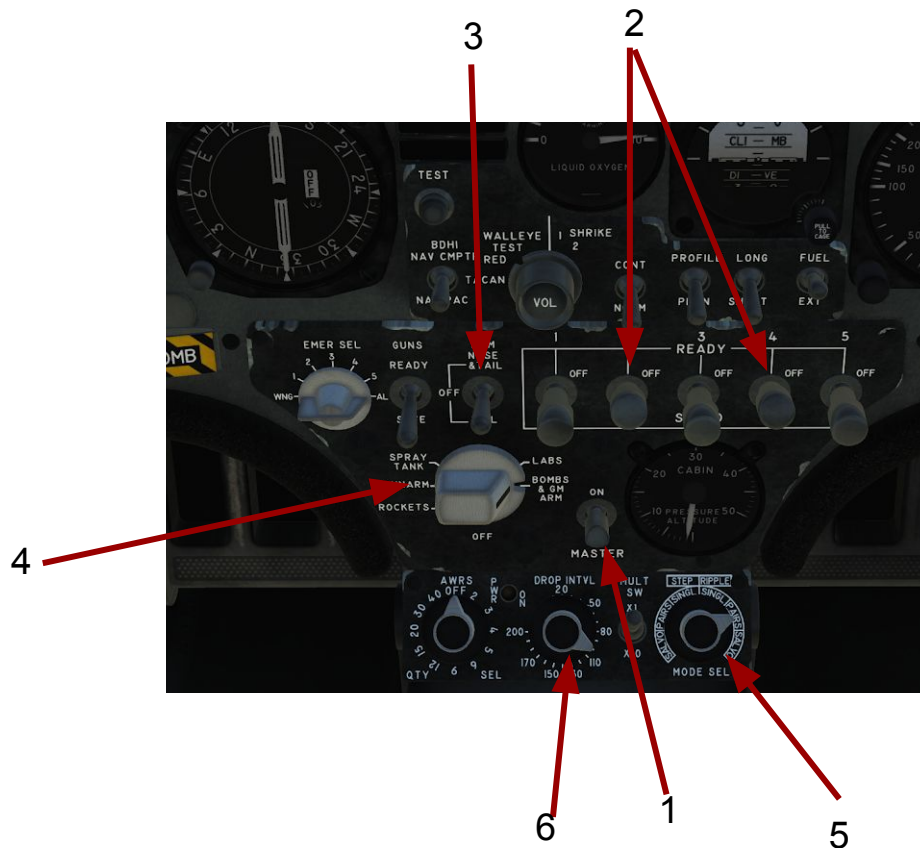
1. Master Arm to ON
2. Select hardpoint with desired bombs (2 and 4 in this case)
3. Set desired fusing (Nose & Tail in this case)
4. Weapon selector dial to Bombs & GM Arm
5. Select delivery number (in this case step pairs)
6. Pickle when on target (weapon release)



8. WEAPONS AND ARMAMENT

Bombs - Ripple Release

1. Master Arm to ON
2. Select hardpoint with desired bombs (2 and 4 in this case)
3. Set desired fusing (Nose & Tail in this case)
4. Weapon selector dial to Bombs & GM Arm
5. Select delivery type (in this case ripple pairs)
6. Set Desired Interval
7. Hold Pickle for duration of weapon drops

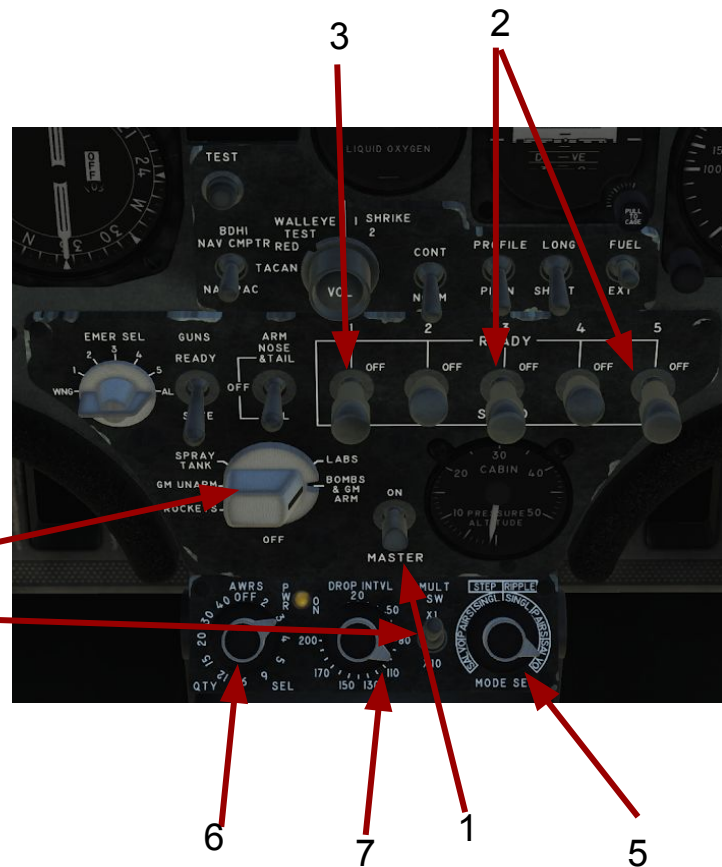


8. WEAPONS AND ARMAMENT

Bombs - Salvo Release

1. Master Arm to ON
2. Select hardpoint with desired bombs (2 and 4 in this case)
3. Set desired fusing (Nose & Tail in this case)
4. Weapon selector dial to Bombs & GM Arm
5. Select release type - salvo ripple
6. Select salvo number
7. Set Desired Interval
8. Hold Pickle for duration of weapon drops

To set more per salvo, use the x10 switch



Bombs - Depression Tables

Up until now I have been unable to find depression tables for all the bombs employed by the A-4E, however, it seems that a lot of the munitions behave very similarly to the Mk 82 Low Drag Bombs - For which I do have depression tables, I will include some indicative values below.

For reference purposes, at 0 ft distance on the reticle, each line away from the centre represents 10 mills

Sourced from the F-5E Weapons Manual

DIVE ANGLE	ALT RANGE TGT	TAS	SOUND RANGE	TIME OF FLIGHT	SLANT RANGE FROM REL FT	IMPACT ANGLE DFG	SIGHT FROM FLIGHT PATH FATH	WIND CORRECTION		CROSS DRIFT FT/KNOT	
								HEAD	TAIL		
DEG	FT	KTS	FT	SEC				NTLS/KNOT			
0	400	363	2469	4.68	2437	15	144	.41	-.39	7.9	.1
		400	2119	4.68	3144	14	130	.38	-.32	7.9	.1
		443	3478	4.68	7451	12	118	.28	-.26	7.9	.1
		480	3777	4.68	1758	11	108	.23	-.22	7.9	.1
		520	4045	4.69	4055	11	100	.20	-.19	7.9	.1
	500	4352	4.69	4270	10		97	.17	-.17	7.9	.1
1	500	760	3161	5.27	3200	17	159	.45	-.43	8.9	.1
		800	3509	5.27	3544	15	143	.37	-.35	8.9	.1
		443	3556	5.27	3484	14	131	.31	-.29	8.9	.1
		480	4203	5.28	4232	12	120	.26	-.25	8.9	.2
		520	4549	5.28	4576	12	111	.22	-.21	8.9	.2
	600	4894	5.28	4919	11	103		.19	-.18	8.9	.2
0	600	760	3478	5.81	3529	18	173	.49	-.47	9.8	.1
		800	3860	5.81	3917	17	156	.46	-.44	9.8	.2
		480	4242	5.81	4284	15	142	.33	-.32	9.8	.2
		480	4623	5.82	4662	14	130	.28	-.27	9.8	.2
		520	5304	5.82	5040	13	121	.24	-.23	9.8	.2
	800	560	5382	5.82	5416	12	112	.21	-.20	9.8	.2
0	700	760	3764	6.38	3834	20	185	.53	-.50	10.6	.2
		800	4183	6.38	4242	18	167	.47	-.44	10.6	.2
		480	4597	6.31	4650	16	153	.36	-.34	10.6	.2
		480	5309	6.31	5058	15	140	.30	-.29	10.7	.2
		520	5471	6.31	5466	14	130	.26	-.25	10.7	.2
	800	5831	6.32	5872	13	121		.22	-.21	10.7	.3
0	800	360	4340	6.76	4118	21	197	.56	-.53	11.4	.2
		400	4454	6.76	4554	19	178	.46	-.43	11.4	.2
		480	4926	6.77	4991	17	162	.38	-.36	11.4	.2
		480	5368	6.77	5427	16	149	.32	-.31	11.4	.2
		520	5809	6.78	5864	15	138	.27	-.26	11.4	.3
	1000	560	6247	6.78	6298	14	128	.24	-.23	11.4	.3
0	900	360	4294	7.19	4387	22	208	.59	-.56	12.1	.2
		400	4765	7.20	4850	20	188	.48	-.46	12.1	.2
		480	5236	7.20	5212	18	171	.40	-.38	12.2	.3
		480	5785	7.21	5775	17	158	.34	-.32	12.2	.3
		520	6177	7.21	6238	16	146	.29	-.28	12.2	.3
	1100	560	6638	7.22	6698	15	136	.25	-.24	12.2	.3
0	1000	360	4574	7.60	4647	23	219	.62	-.58	12.8	.2
		400	5031	7.61	5134	21	198	.50	-.48	12.8	.3
		480	5527	7.61	5617	19	180	.42	-.40	12.8	.3
		480	6022	7.62	6105	18	166	.36	-.34	12.9	.3
		520	6516	7.62	6592	17	153	.30	-.29	12.9	.3
	1200	560	7006	7.63	7077	16	143	.26	-.25	12.9	.4
0	1100	400	5284	8.00	5397	22	237	.53	-.50	13.5	.3
		440	5805	8.00	5908	20	188	.44	-.42	13.5	.3
		480	6324	8.01	6419	19	173	.37	-.36	13.5	.3
		520	6842	8.01	6930	17	160	.32	-.31	13.5	.4
		560	7356	8.02	7438	16	149	.28	-.27	13.5	.4
0	1200	400	5525	8.37	5654	23	215	.55	-.52	14.1	.3
		440	6069	8.37	6186	21	196	.46	-.44	14.1	.3
		480	6612	8.38	6720	20	181	.39	-.37	14.1	.4
		520	7153	8.39	7253	18	167	.33	-.32	14.2	.4
		560	7692	8.40	7783	17	156	.29	-.28	14.2	.4
0	1300	440	6323	8.72	6455	22	234	.47	-.45	14.7	.4
		480	6888	8.74	7009	20	187	.40	-.38	14.8	.4
		520	7451	8.75	7562	19	174	.34	-.33	14.8	.4
		560	8113	8.76	8115	18	162	.29	-.29	14.8	.5

Bombs - Depression Tables

Up until now I have been unable to find depression tables for all the bombs employed by the A-4E, however, it seems that a lot of the munitions behave very similarly to the MK82 Low Drag Bombs - For which I do have depression tables, I will include some indicative values below.

For reference purposes, at 0 ft distance on the reticle, each line away from the centre represents 10 mills

Sourced from the F-5E Weapons Manual

DIVE ANGLE	ALT ARC/VF TGT	TAS	RANG RNG/F	TIME OF FLIGHT	SLANT RANGE FROM REL	IMPACT ANGLE	SIGHT FROM FLIGHT PATH	WIND CORRECTION FACTORS		
DEG	FT	KTS	FT	SEC	FT	DEG	MILS	HEAD MILS/KNOT	TAIL MILS/KNOT	GROSS FT/KT
15	1000	360	2467	4.27	2662	24	126	1.05	-1.00	7.2
		400	2594	4.34	2778	26	109	.91	-.87	6.8
		440	2701	3.82	2880	29	95	.80	-.77	6.5
		480	2746	3.63	2964	23	84	.71	-.69	6.1
		520	2879	3.45	3048	23	74	.64	-.62	5.8
		560	2952	3.29	3117	22	67	.59	-.57	5.5
15	1500	360	3346	5.81	3667	31	161	1.13	-1.08	9.8
		400	3547	5.54	3847	29	143	.98	-.93	9.3
		440	3718	5.29	4009	28	123	.86	-.82	8.9
		480	3873	5.05	4153	26	109	.76	-.73	8.5
		520	4012	4.83	4283	25	97	.68	-.66	8.2
		560	4135	4.63	4399	24	87	.62	-.60	7.8
15	2000	360	4115	7.17	4575	35	192	1.14	-1.14	12.1
		400	4379	6.87	4814	32	168	1.03	-.98	11.6
		440	4617	6.59	5032	30	148	.90	-.87	11.1
		480	4827	6.32	5230	29	132	.80	-.77	10.7
		520	5027	6.08	5410	27	118	.72	-.69	10.3
		560	5201	5.85	5572	26	106	.65	-.63	9.9
15	2500	360	4806	8.40	5417	37	219	1.24	-1.19	14.2
		400	5133	8.08	5710	35	192	1.07	-1.03	13.6
		440	5432	7.74	5979	33	171	.94	-.90	13.1
		480	5704	7.49	6226	31	152	.81	-.80	12.6
		520	5952	7.22	6456	29	137	.75	-.72	12.2
		560	6177	6.97	6663	28	124	.68	-.65	11.8
15	3000	360	5438	9.53	6210	40	244	1.28	-1.23	16.1
		400	5825	9.20	6552	37	215	1.11	-1.07	15.5
		440	6181	8.88	6870	35	191	.97	-.94	15.0
		480	6508	8.58	7166	33	171	.86	-.83	14.5
		520	6808	8.29	7440	31	154	.77	-.75	14.0
		560	7081	8.03	7690	30	140	.70	-.68	13.5
15	3500	360	6467	10.24	7354	39	235	1.15	-1.10	17.3
		400	6878	9.91	7717	37	210	1.00	-.97	16.7
		440	7257	9.59	8057	35	188	.89	-.86	16.2
		480	7608	9.29	8374	33	170	.80	-.77	15.7
		520	7927	9.02	8665	31	155	.72	-.70	15.2
15	4000	360	7532	10.88	8524	38	227	1.03	-.99	18.4
		400	7961	10.55	8910	36	205	.92	-.88	17.8
		440	8360	10.24	9268	34	185	.82	-.79	17.3
		480	8724	9.96	9597	33	169	.74	-.72	16.8
15	4500	360	8627	11.46	9731	38	220	.94	-.91	19.3
		400	9073	11.14	10128	36	199	.84	-.81	18.8
		440	9478	10.86	10492	34	182	.76	-.74	18.3
15	5000	360	9751	12.01	10958	37	213	.86	-.83	20.3
		400	10197	11.72	11357	36	195	.78	-.76	19.8
15	5500	360	10399	12.84	11764	38	225	.88	-.85	21.7
		400	10883	12.55	12194	37	207	.80	-.77	21.2
20	1000	360	2048	3.64	2279	31	108	1.23	-1.17	6.1
		400	2129	3.41	2352	29	93	1.07	-1.03	5.8
		440	2197	3.20	2414	28	80	.95	-.92	5.4
		480	2255	3.01	2467	27	71	.86	-.83	5.1
		520	2304	2.84	2512	26	63	.78	-.75	4.8
		560	2347	2.68	2551	25	56	.71	-.69	4.5
20	1500	360	2837	5.06	3209	34	139	1.28	-1.22	8.5
		400	2971	4.77	3329	32	120	1.12	-1.07	8.1
		440	3088	4.51	3433	31	105	.99	-.96	7.6
		480	3188	4.27	3524	29	92	.89	-.86	7.2
		520	3276	4.05	3603	28	82	.81	-.78	6.8
		560	3352	3.85	3672	27	73	.74	-.72	6.5
20	2000	360	3539	6.14	4065	37	167	1.33	-1.27	10.7
		400	3727	6.81	4230	35	145	1.16	-1.12	10.1
		440	3883	6.49	4377	33	127	1.03	-.99	9.6
		480	4030	6.19	4506	32	112	.92	-.89	9.2
		520	4166	5.97	4621	30	100	.83	-.81	8.7
		560	4278	5.73	4723	29	89	.76	-.74	8.3

8. WEAPONS AND ARMAMENT

DIVE ANGLE	ALT ABOVE TGT	TAS	BOMB RANGE	TIME OF FLIGHT	SLANT RANGE FROM REL	IMPACT ANGLE	SIGHT DEP FROM FLIGHT PATH	WIND CORRECTION FACTORS			DIVE ANGLE	ALT ABOVE TGT	TAS	BOMB RANGE	TIME OF FLIGHT	SLANT RANGE FROM REL	IMPACT ANGLE	SIGHT DEP FROM FLIGHT PATH	WIND CORRECTION FACTORS		
								HEAD	TAIL	GROSS									HEAD	TAIL	GROSS
DEG	FT	KTS	FT	SEC	FT	DEG	MILS	MILS/KNOT	FT/KT	DEG	FT	KTS	FT	SEC	FT	DEG	MILS	MILS/KNOT	FT/KT	FT/KT	
15	1000	360	2467	4.27	2662	28	126	1.05	-1.09	7.2	20	2500	360	4177	7.50	4568	39	192	1.37	-1.31	12.7
		400	2596	4.14	2778	26	109	.91	-.87	6.8			400	4418	7.14	5077	37	167	1.20	-1.15	12.1
		440	2701	3.82	2880	25	95	.80	-.77	6.5			440	4633	6.81	5264	35	147	1.06	-1.02	11.5
		480	2746	3.53	2969	23	86	.71	-.69	6.1			480	4822	6.50	5432	33	130	.95	-.92	11.0
		520	2760	3.25	3048	23	78	.64	-.62	5.8			520	4992	6.21	5583	32	116	.86	-.83	10.5
		560	2952	2.99	3117	22	67	.59	-.57	5.5			560	5142	5.95	5717	31	105	.78	-.76	10.0
15	1500	360	3547	5.81	3667	31	161	1.13	-1.08	9.4	20	3000	360	4766	8.58	5631	41	214	1.41	-1.35	14.5
		400	3647	5.54	3847	29	143	.98	-.93	9.3			400	5058	8.20	5881	39	187	1.23	-1.18	13.8
		440	3715	5.29	4004	28	123	.86	-.82	8.9			440	5320	7.84	6108	37	165	1.05	-1.01	13.2
		480	3873	5.05	4153	26	109	.76	-.73	8.5			480	5555	7.51	6313	35	147	.97	-.94	12.7
		520	4012	4.83	4283	25	97	.68	-.66	8.2			520	5765	7.20	6499	34	132	.88	-.85	12.1
		560	4135	4.63	4399	24	87	.62	-.60	7.4			560	5952	6.92	6665	32	119	.80	-.78	11.7
15	2000	360	4115	7.17	4575	35	192	1.19	-1.14	12.1	20	3500	360	5315	9.59	6364	43	234	1.43	-1.37	16.2
		400	4179	6.87	4814	32	168	1.03	-.98	11.6			400	5657	9.19	6652	41	206	1.26	-1.21	15.5
		440	4617	6.59	5032	30	148	.90	-.87	11.1			440	5965	8.82	6916	39	183	1.11	-1.07	14.9
		480	4827	6.32	5210	29	132	.80	-.77	10.7			480	6243	8.46	7157	37	163	1.00	-.96	14.3
		520	5027	6.08	5410	27	118	.72	-.69	10.3			520	6494	8.13	7377	35	146	.90	-.87	13.7
		560	5201	5.85	5572	26	106	.65	-.63	9.9			560	6718	7.83	7575	34	132	.82	-.80	13.2
15	2500	360	4806	8.40	5417	37	219	1.24	-1.19	14.2	20	4000	400	6220	10.13	7395	42	223	1.28	-1.23	17.1
		400	5133	8.18	5710	35	192	1.07	-1.03	13.6			440	6573	9.74	7695	40	198	1.13	-1.09	16.4
		440	5432	7.74	5979	33	171	.94	-.90	13.1			480	6894	9.37	7970	38	177	1.02	-.98	15.8
		480	5704	7.49	6228	31	152	.81	-.80	12.6			520	7145	9.32	8224	37	160	.92	-.89	15.2
		520	5952	7.22	6456	29	137	.75	-.72	12.2			560	7445	8.71	8452	35	145	.84	-.81	14.7
		560	6177	6.97	6663	28	124	.68	-.65	11.8											
15	3000	360	5438	9.53	6210	40	244	1.28	-1.23	16.1	20	4500	400	6755	11.03	8116	44	239	1.30	-1.25	18.6
		400	5825	9.10	6552	37	215	1.11	-1.07	15.5			440	7151	10.62	8449	42	213	1.15	-1.11	17.9
		440	6181	8.68	6870	35	191	.97	-.94	15.0			480	7513	10.24	8758	40	191	1.03	-1.00	17.3
		480	6508	8.28	7166	33	171	.86	-.83	14.5			520	7845	9.84	9043	38	172	.93	-.90	16.7
		520	6808	8.09	7446	31	154	.77	-.75	14.0			560	8139	9.56	9200	36	157	.85	-.83	16.1
		560	7081	8.03	7690	30	149	.70	-.68	13.5											
15	3500	400	6467	10.24	7354	39	235	1.15	-1.10	17.3	20	5000	480	8145	11.07	9523	41	204	1.05	-1.02	18.7
		440	6878	9.91	7717	37	210	1.00	-.97	16.7			520	8474	10.70	9839	39	185	.95	-.92	18.1
		480	7257	9.59	8057	35	188	.89	-.86	16.2			560	8801	10.37	10124	38	168	.87	-.84	17.5
		520	7628	9.29	8374	33	170	.80	-.77	15.7											
		560	7927	9.02	8665	31	155	.72	-.70	15.2			440	8220	12.24	9899	44	241	1.19	-1.15	20.7
													480	8678	11.47	10249	42	217	1.05	-1.03	20.0
15	4000	440	7532	10.88	8528	38	227	1.03	-.99	18.4	20	5500	520	8774	11.20	10614	43	196	.93	-.90	19.6
		480	7961	10.55	8910	36	205	.92	-.88	17.8			560	9440	11.16	10926	39	179	.88	-.86	18.4
		520	8360	10.24	9268	34	185	.82	-.79	17.3			480	9218	12.65	11498	43	229	1.08	-1.04	21.3
		560	8724	9.96	9597	33	169	.74	-.72	16.8			520	9668	12.26	11372	41	207	.98	-.95	20.7
													560	10594	11.97	11798	40	190	.90	-.87	20.1
													480	12222	13.00	12114	42	210	.99	-.96	21.9
15	4500	480	8627	11.46	9731	38	220	.94	-.91	19.3	20	6000	560	10645	12.67	12473	41	203	.91	-.88	21.4
		520	9073	11.14	10128	36	199	.84	-.81	18.8											
		560	9478	10.86	10492	34	182	.76	-.74	18.3			480	12134	3.72	2608	43	191	1.42	-1.37	6.3
													440	2189	3.47	2654	38	79	1.28	-1.23	5.9
													480	2236	3.25	2692	37	69	1.16	-1.12	5.5
15	5000	520	9751	12.01	10958	37	213	.86	-.83	20.3	20	6500	560	10645	12.67	12473	41	203	.91	-.88	21.4
		560	10197	11.72	11357	36	195	.78	-.76	19.8											
													480	2134	3.72	2608	43	191	1.42	-1.37	6.3
													440	2189	3.47	2654	38	79	1.28	-1.23	5.9
													480	2236	3.25	2692	37	69	1.16	-1.12	5.5
20	1000	360	2048	3.64	2279	31	108	1.23	-1.17	6.1	20	2000	360	2631	5.12	3234	43	128	1.62	-1.56	8.6
		400	2129	3.41	2352	29	93	1.07	-1.03	5.4			400	2730	4.78	3345	41	110	1.44	-1.39	8.1
		440	2197	3.20	2414	28	80	.95	-.92	5.4			440	2815	4.47	3453	39	96	1.30	-1.25	7.6
		480	2295	3.01	2467	27	71	.86	-.83	5.1			480	2885	4.20	3511	38	84	1.18	-1.14	7.1
		520	2304	2.84	2512	26	63	.78	-.75	4.8			520	2946	3.96	3561	37	74	1.08	-1.04	6.7
		560	2347	2.68	2551	25	56	.71	-.69	4.5			560	2997	3.74	3603	37	66	.99	-.96	6.3
20	1500	360	2837	5.06	3209	34	139	1.28	-1.22	8.5	20	2500	360	3154	6.15	4025	45	148	1.64	-1.58	10.4
		400	2971	4.77	3329	32	120	1.12	-1.07	8.1			400	3288	5.77	4131	43	128	1.46	-1.41	9.7
		440	3088	4.51	3433	31	105	.99	-.96	7.6			440	3407	5.42	4222	41	112	1.31	-1.27	9.2
		480	3188	4.27	3524	29	92	.89	-.86	7.2			480	3509	5.11	4291	40	98	1.19	-1.15	8.6
		520	3276	4.05	3603	28	82	.81	-.78	6.8			520	3561	4.83	4369	39	87	1.09	-1.06	8.2
		560	3352	3.85	3672	27	73	.74	-.72	6.5			560	3658	4.58	4428	38	78	1.00	-.97	7.7
20	2000	360	3539	6.54	4065	37	167	1.33	-1.27	10.7	20	3000	360	3845	7.12	4721	46	166	1.66	-1.59	12.0
		400	3727	6.31	4230	35	145	1.16	-1.12	10.1			400	3814	6.71	4853	44	144	1.47	-1.42	11.3
		440	3893	5.70	4377	33	127	1.03	-.99	9.6			440	3959	6.33	4967	41	126	1.33	-1.28	10.7
		480	4036	5.43	4506	32	112	.92	-.89	9.2			480	4108	6.04	5078	41	113	1.15	-1.10	10.1
		520	4166	5.17	4621	30	89	.80	-.77	8.8			520	4192	5.67	5155	40	99	1.10	-1.07	9.6
		560	4278	4.93	4723	29	81	.76	-.74	8.3			560	4285	5.38	5230	39	88	1.01	-.99	9.1

8. WEAPONS AND ARMAMENT

DIVE ANGLE	ALT ABOVE TGT	TAS	BOMB RANGE	TIME OF FLIGHT	SLANT RANGE FROM REL	IMPACT ANGLE	SIGHT DEP FROM FLIGHT PATH	WIND CORRECTION FACTORS	DIVE ANGLE	ALT ABOVE TGT	TAS	BOMB RANGE	TIME OF FLIGHT	SLANT RANGE FROM REL	IMPACT ANGLE	SIGHT DEP FROM FLIGHT PATH	WIND CORRECTION FACTORS	
DEG	FT	KTS	FT	SEC	FT	DEG	MILS	HEAD TAIL CROSS MILS/KNOT FT/KT	DEG	FT	KTS	FT	SEC	FT	DEG	MILS	HEAD TAIL CROSS MILS/KNOT FT/KT	
30	3500	160	4109	8.05	5397	48	183	1.67 -1.61 13.6	30	9500	480	10024	15.08	13811	51	235	1.29 -1.25 25.4	
		400	4312	7.60	5954	46	159	1.49 -1.43 12.8			520	10457	14.59	14128	51	214	1.19 -1.16 24.6	
		440	4488	7.19	5692	44	140	1.34 -1.29 12.1			560	10826	14.20	14403	50	197	1.11 -1.08 24.0	
		480	4641	6.81	5813	43	124	1.21 -1.18 11.5	30	10800	480	10408	15.67	14428	54	243	1.29 -1.26 26.4	
		520	4775	6.47	5920	41	110	1.11 -1.08 10.9			520	10854	15.19	14759	52	221	1.19 -1.16 25.6	
		560	4889	6.17	6013	40	99	1.02 -1.00 10.4			560	11241	14.79	15045	51	204	1.12 -1.09 25.0	
30	4000	160	4549	8.93	6057	49	199	1.68 -1.62 15.1	45	2500	360	2042	4.99	3228	55	102	2.03 -1.96 8.3	
		430	4747	8.45	6238	47	174	1.50 -1.45 14.3			400	2103	4.53	3267	53	90	1.83 -1.77 7.7	
		440	4994	8.32	6398	45	153	1.35 -1.30 13.5			440	2152	4.21	3299	52	76	1.66 -1.62 7.1	
		480	5175	7.62	6541	44	135	1.22 -1.19 12.9	45	3000	360	2387	5.74	3834	56	115	2.02 -1.95 9.7	
		520	5335	7.25	6668	42	121	1.12 -1.09 12.2			430	2466	5.33	3884	55	99	1.82 -1.77 9.0	
		560	5472	6.92	6776	41	109	1.03 -1.01 11.7			440	2541	4.97	3925	52	86	1.66 -1.62 8.4	
30	4500	160	4969	9.77	6703	51	213	1.69 -1.63 16.5			480	2585	4.64	3960	52	76	1.52 -1.49 7.8	
		430	5247	9.28	6907	48	187	1.51 -1.46 15.7	45	3500	360	2718	6.55	4431	57	127	2.31 -1.95 11.1	
		440	5479	8.82	7030	46	165	1.36 -1.31 14.9			400	2816	6.19	4492	56	109	1.82 -1.76 10.3	
		480	5689	8.38	7254	45	146	1.23 -1.20 14.2			440	2897	5.70	4544	54	95	1.66 -1.61 9.6	
		520	5874	8.10	7399	43	131	1.13 -1.10 13.5			480	2955	5.34	4597	52	84	1.52 -1.48 9.0	
		560	6034	7.66	7527	42	118	1.04 -1.01 12.9			520	3023	5.02	4625	52	74	1.41 -1.37 8.5	
30	5000	160	5370	10.58	7334	52	227	1.69 -1.63 17.9	45	4000	360	3036	7.33	5021	58	137	2.30 -1.94 12.4	
		430	5678	10.17	7584	50	199	1.51 -1.46 17.0			400	3163	6.84	5093	56	119	1.81 -1.76 11.5	
		440	5945	9.69	7768	48	176	1.34 -1.32 16.2			440	3251	6.40	5155	55	104	1.65 -1.61 10.8	
		480	6184	9.24	7952	46	157	1.24 -1.20 15.4			480	3334	5.91	5217	54	92	1.52 -1.48 10.2	
		520	6395	8.73	8118	44	141	1.14 -1.10 14.7			520	3403	5.47	5263	53	81	1.41 -1.37 9.6	
		560	6577	8.17	8262	43	127	1.05 -1.02 14.1			560	3462	5.16	5291	52	73	1.31 -1.28 9.0	
30	5500	160	5764	11.16	7962	53	240	1.70 -1.64 19.2	45	4500	360	3341	8.08	5605	59	148	1.99 -1.93 13.6	
		430	6094	10.43	8209	51	211	1.52 -1.47 18.3			400	3478	7.54	5688	57	128	1.80 -1.74 12.8	
		440	6395	10.33	8435	49	188	1.37 -1.33 17.4			440	3544	7.09	5759	56	112	1.65 -1.60 12.0	
		480	6662	9.47	8639	47	167	1.25 -1.21 16.7			480	3632	6.67	5821	55	99	1.52 -1.48 11.3	
		520	6899	9.44	8823	45	150	1.14 -1.11 15.9			520	3776	6.30	5874	54	88	1.41 -1.37 10.6	
		560	7104	9.07	8984	44	136	1.06 -1.03 15.3			560	3844	5.97	5920	53	79	1.31 -1.28 10.1	
30	6000	160	6128	12.12	8576	54	252	1.70 -1.64 20.5	45	5000	360	3637	8.81	6193	60	158	1.98 -1.92 14.9	
		430	6499	11.57	8845	52	223	1.52 -1.48 19.5			400	3794	8.26	6277	58	137	1.80 -1.75 13.9	
		440	6829	11.05	9090	50	198	1.38 -1.34 18.7			440	3927	7.77	6358	57	121	1.65 -1.60 13.1	
		480	7124	10.57	9314	48	177	1.25 -1.22 17.8			480	4041	7.32	6429	55	107	1.52 -1.48 12.5	
		520	7387	10.13	9517	46	159	1.15 -1.12 17.1			520	4139	6.92	6491	54	95	1.40 -1.37 11.7	
		560	7614	9.76	9694	45	144	1.07 -1.04 16.5			560	4220	6.57	6543	54	85	1.31 -1.28 11.1	
30	6500	160	6889	12.79	9472	53	233	1.53 -1.48 20.7	45	5500	360	3923	9.52	6756	61	167	1.97 -1.91 16.1	
		430	7258	11.76	9737	50	208	1.38 -1.34 19.8			400	4100	8.94	6860	59	146	1.79 -1.74 15.1	
		440	7577	11.26	9980	49	186	1.26 -1.22 19.0			440	4251	8.42	6957	57	128	1.64 -1.60 14.2	
		480	7861	10.41	10200	47	168	1.16 -1.13 18.2			480	4381	7.95	7032	56	114	1.51 -1.48 13.4	
		520	8113	10.43	10393	46	153	1.07 -1.05 17.6			520	4497	7.53	7102	55	101	1.40 -1.37 12.7	
		560	8313	10.43	10393	46	153	1.07 -1.05 17.6			560	4586	7.16	7161	54	91	1.31 -1.29 12.1	
30	7000	160	7268	12.98	10091	53	244	1.53 -1.49 21.9	45	6000	360	4200	10.21	7324	61	176	1.96 -1.90 17.2	
		430	7658	12.44	10375	51	218	1.39 -1.35 21.0			400	4367	9.61	7429	60	154	1.78 -1.73 16.2	
		440	8004	11.93	10637	49	195	1.27 -1.23 20.1			440	4467	9.06	7540	58	136	1.64 -1.60 15.3	
		480	8322	11.47	10875	48	176	1.16 -1.13 19.4			480	4571	8.57	7629	57	120	1.51 -1.48 14.5	
		520	8592	11.08	11083	46	161	1.08 -1.05 18.7			520	4638	8.12	7704	56	108	1.40 -1.37 13.7	
		560	8842	11.08	11083	46	161	1.08 -1.05 18.7			560	4744	7.74	7774	55	97	1.31 -1.29 13.1	
30	7500	160	7636	13.66	10703	54	253	1.54 -1.49 23.1	45	6500	360	4469	10.88	7888	62	184	1.95 -1.90 18.4	
		430	8054	13.11	11006	52	227	1.39 -1.35 22.1			400	4686	10.26	8013	60	162	1.78 -1.73 17.3	
		440	8432	12.59	11285	50	204	1.27 -1.24 21.2			440	4774	9.69	8124	59	143	1.63 -1.59 16.4	
		480	8771	12.12	11540	49	184	1.17 -1.14 20.5			480	4876	9.17	8223	57	127	1.51 -1.47 15.5	
		520	9062	11.73	11763	47	168	1.09 -1.06 19.8			520	4976	8.71	8309	56	114	1.40 -1.37 14.7	
		560	9302	11.73	11763	47	168	1.09 -1.06 19.8			560	5074	8.24	8383	55	103	1.31 -1.29 14.0	
30	8000	160	7441	13.76	11629	53	236	1.49 -1.46 23.2	45	7000	360	4730	11.53	8448	63	192	1.94 -1.89 19.5	
		430	8845	13.23	11926	51	212	1.27 -1.24 22.3			400	4868	10.89	8584	61	169	1.77 -1.73 18.4	
		440	9208	12.75	12198	49	192	1.17 -1.14 21.5			440	4976	10.19	8705	59	150	1.63 -1.59 17.4	
		480	9519	12.36	12434	48	176	1.09 -1.07 20.9			480	5050	9.77	8812	58	133	1.50 -1.47 16.5	
		520	9634	13.38	12848	50	208	1.18 -1.15 22.6			520	5507	9.29	8927	57	119	1.40 -1.37 15.7	
		560	9965	12.98	13098	49	183	1.10 -1.07 21.9			560	5637	8.88	8987	56	108	1.32 -1.29 15.0	
30	8500	160	8817	14.39	12247	54	244	1.49 -1.46 24.3	45	7500	360	4985	12.17	9086	63	199	1.93 -1.88 20.5	
		430	9248	13.86	12561	52	228	1.28 -1.24 23.4			400	5247	11.51	9151	61	176	1.76 -1.72 19.4	
		440	9634	13.38	12848	50	208	1.18 -1.15 22.6			440	5367	10.89	9281	60	156	1.62 -1.59 18.4	
		480	9965	12.98	13098	49	183	1.10 -1.07 21.9			480	5467	10.35	9397	59	139	1.51 -1.47 17.5	
30	9000	160	9641	14.47	13189	52	228	1.28 -1.25 24.4			520	5637	9.86	9500	57	125	1.40 -1.37 16.6	
		430	10050	13.99	13491	51	207	1.18 -1.15 23.6			560	5973	9.44	9588	56	117	1.32 -1.29 15.9	
		440	10400	13.59	13754	49	190	1.11 -1.08 22.9										

DIVE ANGLE	ALT ABOVE TGT	TAS	BOMB RANGE	TIME OF FLIGHT	SLANT RANGE FROM REL	IMPACT ANGLE	SIGHT DEP FROM FLIGHT PATH	WIND CORRECTION FACTORS		
								HEAD	TAIL	CROSS
DEG	FT	KTS	FT	SEC	FT	DEG	MILS	MILS/KNOT	FT/KT	
30	9500	480	10024	15.08	13811	51	235	1.29	-1.25	25.4
		520	10457	14.59	14128	51	214	1.19	-1.16	24.6
		560	10826	14.20	14403	50	197	1.11	-1.08	24.0
30	10800	480	10408	15.67	14428	54	243	1.29	-1.26	26.4
		520	10854	15.19	14759	52	221	1.19	-1.16	25.6
		560	11241	14.79	15045	51	204	1.12	-1.09	25.0
45	2500	360	2042	4.99	3228	55	132	2.83	-1.96	8.3
		400	2103	4.53	3267	53	88	1.83	-1.77	7.7
		440	2152	4.21	3299	52	76	1.66	-1.62	7.1
45	3000	360	2387	5.74	3834	56	115	2.82	-1.95	9.7
		400	2466	5.33	3894	55	99	1.82	-1.77	9.0
		440	2541	4.97	3925	53	86	1.66	-1.62	8.4
		480	2585	4.64	3960	52	76	1.52	-1.49	7.8
45	3500	360	2718	6.55	4431	57	127	2.81	-1.95	11.1
		400	2816	6.10	4492	56	109	1.82	-1.76	10.3
		440	2897	5.70	4544	54	95	1.66	-1.61	9.6
		480	2965	5.34	4597	52	84	1.52	-1.48	9.0
		520	3023	5.02	4625	52	74	1.41	-1.37	8.5
45	4000	360	3036	7.33	5021	58	177	2.80	-1.94	12.4
		400	3163	6.84	5093	56	119	1.81	-1.76	11.5
		440	3255	6.40	5155	55	101	1.65	-1.61	10.8
		480	3334	6.01	5227	54	92	1.52	-1.48	10.2
		520	3404	5.67	5293	53	81	1.41	-1.37	9.6
45	4500	360	3462	5.36	5291	52	73	1.31	-1.28	9.0
		360	3361	8.08	5605	59	144	1.99	-1.93	13.6
		400	3479	7.56	5688	57	128	1.80	-1.76	12.8
		440	3544	7.09	5759	56	112	1.65	-1.61	12.0
		480	3632	6.67	5824	55	99	1.52	-1.48	11.3
45	5000	520	3776	6.26	5874	54	83	1.41	-1.37	10.6
		560	3846	5.97	5920	52	79	1.31	-1.28	10.1
		360	3637	8.41	6183	60	158	1.98	-1.92	14.9
		400	3758	8.26	6277	58	137	1.80	-1.75	13.9
		440	3927	7.77	6358	57	121	1.65	-1.60	13.1
45	5500	480	4041	7.82	6429	55	107	1.52	-1.48	12.4
		520	4130	6.92	6491	54	95	1.40	-1.37	11.7
		560	4220	6.57	6543	54	85	1.31	-1.28	11.1
		360	3923	9.52	6756	61	167	1.97	-1.91	16.1
		400	4100	8.94	6860	59	146	1.79	-1.74	15.1
45	6000	440	4251	8.42	6972	57	178	1.84	-1.60	14.2
		480	4381	7.95	7082	56	114	1.51	-1.48	13.4
		520	4447	7.53	7182	55	91	1.40	-1.37	12.7
		560	4506	7.16	7161	54	91	1.31	-1.29	12.1
		360	4200	10.21	7324	61	176	1.96	-1.90	17.2
45	6500	400	4397	9.61	7429	60	154	1.79	-1.74	16.2
		440	4567	9.06	7540	58	176	1.68	-1.60	15.3
		480	4713	8.57	7629	57	120	1.51	-1.48	14.5
		520	4828	8.12	7728	56	108	1.40	-1.37	13.7
		560	4944	7.74	7774	55	97	1.31	-1.29	13.1
45	7000	360	4469	10.48	7488	62	184	1.95	-1.90	14.4
		400	4684	10.26	8013	60	163	1.78	-1.73	17.3
		440	4874	9.45	8124	59	163	1.62	-1.59	16.5
		480	5036	9.17	8223	57	127	1.51	-1.47	15.7
		520	5176	8.71	8309	56	114	1.40	-1.37	14.7
45	7500	560	5244	8.82	8383	55	103	1.31	-1.29	14.0
		360	4730	11.53	8448	63	192	1.94	-1.89	19.5
		400	4968	10.89	8584	61	169	1.77	-1.73	18.4
		440	5174	10.19	8705	59	150	1.63	-1.59	17.4
		480	5353	9.77	8822	58	133	1.50	-1.47	16.5
45	8000	520	5507	9.28	8907	57	118	1.40	-1.37	15.7
		560	5637	8.88	8987	56	118	1.32	-1.29	15.0
		360	4865	12.17	9086	63	199	1.93	-1.88	20.5
		400	5247	11.45	9151	62	176	1.76	-1.72	19.4
		440	5467	10.90	9281	60	156	1.62	-1.59	18.4
45	8500	480	5667	10.35	9397	59	139	1.50	-1.47	17.5
		520	5821	9.86	9500	57	125	1.40	-1.37	16.6
		560	5978	9.40	9580	56	118	1.32	-1.29	15.9
		360	5085	13.07	9686	64	204	1.93	-1.88	21.4
		400	5347	12.31	9756	62	181	1.76	-1.72	20.4

8. WEAPONS AND ARMAMENT

Bombs - Depression Tables

The same tables for the Mk82 SE now follow

DIVE ANGLE	ALT ABOVE TGT	TAS	DOWN RANGE	TIME OF FLIGHT	SLANT RANGE FROM REF	IMPACT ANGLE	SIGHT FROM FLIGHT PATH	DEP FACTORS	WIND CORRECTION FACTORS	CROSS DRIFT GRAB FT/KNOT
DFG	FT	KTS	FT	SEC	FT	DEG	FT/LS	MTLS/KNOT		
9	100	760	1170	2.44	1174	11	90	.33	-.31	4.1 .9
		400	1284	2.46	1288	10	82	.28	-.26	4.2 .9
		440	1395	2.49	1398	9	76	.24	-.22	4.2 1.0
		480	1507	2.51	1516	9	70	.20	-.19	4.2 1.1
		520	1618	2.53	1611	8	66	.18	-.17	4.3 1.2
0	125	560	1711	2.56	1714	8	62	.16	-.15	4.3 1.3
		760	1293	2.80	1299	12	101	.38	-.36	4.7 1.1
		470	1416	2.83	1421	12	92	.32	-.30	4.8 1.2
		440	1534	2.86	1539	11	85	.28	-.26	4.8 1.3
		490	1656	2.89	1659	11	79	.24	-.21	4.9 1.4
9	150	520	1762	2.91	1766	10	74	.21	-.20	4.9 1.5
		560	1871	2.94	1875	10	70	.19	-.18	5.0 1.6
		360	1398	3.12	1436	14	111	.44	-.40	5.3 1.4
		400	1528	3.16	1536	13	102	.37	-.34	5.3 1.5
		440	1652	3.20	1660	13	94	.32	-.30	5.4 1.6
0	175	490	1774	3.23	1780	12	88	.28	-.26	5.4 1.8
		520	1891	3.26	1897	12	82	.25	-.23	5.5 1.9
		560	2005	3.29	2011	11	78	.22	-.21	5.6 2.0
		360	1492	3.47	1502	16	121	.49	-.45	5.8 1.7
		400	1627	3.47	1636	15	111	.41	-.39	5.9 1.8
9	200	440	1757	3.51	1765	14	103	.36	-.34	5.9 1.9
		480	1882	3.55	1899	14	96	.31	-.30	6.0 2.1
		520	2004	3.58	2011	13	90	.28	-.26	6.0 2.2
		560	2121	3.62	2128	13	85	.25	-.24	6.1 2.3
		360	1575	3.72	1587	18	130	.54	-.50	6.3 1.9
0	225	400	1714	3.77	1726	17	120	.46	-.43	6.4 2.1
		440	1849	3.81	1859	16	111	.40	-.37	6.4 2.2
		480	1978	3.85	1988	15	104	.35	-.33	6.5 2.4
		520	2103	3.88	2112	15	98	.31	-.30	6.6 2.5
		560	2227	3.92	2232	15	92	.28	-.27	6.6 2.6
9	250	360	1650	4.00	1665	19	139	.59	-.54	6.7 2.2
		400	1793	4.04	1808	18	128	.50	-.47	6.8 2.3
		440	1921	4.09	1944	18	119	.44	-.41	6.9 2.5
		480	2064	4.13	2076	17	112	.39	-.36	7.0 2.7
		520	2192	4.17	2203	17	105	.35	-.33	7.0 2.8
0	275	560	2315	4.21	2325	16	99	.31	-.30	7.1 3.0
		360	1718	4.26	1736	21	148	.64	-.59	7.2 2.4
		400	1866	4.31	1892	20	137	.55	-.51	7.3 2.6
		440	2007	4.35	2022	19	127	.48	-.45	7.3 2.8
		480	2142	4.40	2157	19	119	.42	-.40	7.4 3.0
9	300	520	2272	4.44	2286	18	112	.38	-.36	7.5 3.1
		560	2397	4.48	2410	18	106	.35	-.32	7.6 3.3
		360	1781	4.50	1802	22	157	.69	-.64	7.6 2.7
		400	1932	4.56	1951	22	145	.59	-.55	7.7 2.9
		440	2076	4.61	2094	21	135	.52	-.48	7.8 3.1
0	400	480	2213	4.66	2230	20	126	.46	-.43	7.9 3.2
		520	2346	4.70	2362	20	119	.42	-.39	7.9 3.4
		560	2473	4.74	2488	19	113	.38	-.35	8.0 3.6
		360	1940	4.74	1864	24	165	.74	-.68	8.0 2.9
		400	2139	4.80	2016	23	153	.64	-.59	8.1 3.1
9	450	440	2139	4.85	2160	22	142	.56	-.52	8.2 3.3
		480	2279	4.90	2299	22	134	.50	-.47	8.3 3.5
		520	2417	4.95	2432	21	126	.45	-.42	8.4 3.7
		560	2542	4.99	2550	21	120	.41	-.38	8.4 3.9
		360	2340	5.67	2079	30	197	.94	-.86	9.5 3.8
0		400	2701	5.69	2277	29	183	.82	-.75	9.6 4.1
		440	2855	5.75	2389	28	171	.72	-.67	9.7 4.4
		480	2902	5.81	2533	27	161	.65	-.60	9.8 4.6
		520	2941	5.86	2672	27	153	.59	-.55	9.9 4.8
		560	2775	5.91	2804	26	145	.54	-.50	10.0 5.0

8. WEAPONS AND ARMAMENT

DIVE ANGLE	ALT ABOVE TGT	TAS	ROMP RANGE	TIME OF FLIGHT	SLANT RANGE FROM REL	IMPACT ANGLE	SIGHT DEP FROM FLIGHT PATH	WIND CORRECTION FACTORS	DIVE ANGLE	ALT ABOVE TGT	TAS	ROMP RANGE	TIME OF FLIGHT	SLANT RANGE FROM REL	IMPACT ANGLE	SIGHT DEP FROM FLIGHT PATH	WIND CORRECTION FACTORS
DEG	FT	KTS	FT	SEC	FT	DEG	MILS	HEAD TAIL MILS/KNOT	DEG	FT	KTS	FT	SEC	FT	DEG	MILS	HEAD TAIL MILS/KNOT
10	400	360	1394	7.19	1446	74	110	1.99 -1.02 5.4	10	1510	520	3260	9.60	1598	54	259	1.98 -1.83 16.2
		400	1464	7.06	1517	22	96	.95 -0.89 5.2			560	3385	9.53	1702	53	245	1.85 -1.70 16.1
		440	1524	7.03	1582	21	85	.83 -0.78 4.9	20	700	360	1415	3.54	1579	74	114	1.76 -1.65 6.0
		480	1594	7.01	1639	20	76	.74 -0.70 4.7			430	1472	3.43	1610	33	98	1.40 -1.30 5.4
		520	1643	7.00	1691	19	68	.67 -0.63 4.5			440	1521	3.14	1675	31	96	1.38 -1.30 5.3
		560	1691	7.04	1738	18	61	.60 -0.57 4.4	20	800	360	1555	4.09	1748	37	118	1.90 -1.77 6.9
10	500	360	1597	7.93	1674	28	133	1.25 -1.16 6.6			430	1622	3.87	1804	35	113	1.67 -1.57 6.5
		400	1688	7.80	1760	26	117	1.09 -1.02 6.4			440	1680	3.66	1861	33	98	1.49 -1.40 6.2
		440	1778	7.67	1839	25	104	.96 -0.90 6.2			480	1771	3.47	1907	32	87	1.34 -1.27 5.9
		480	1845	7.54	1912	23	93	.86 -0.81 6.0	20	900	360	1681	4.63	1907	40	146	2.03 -1.89 7.8
		520	1913	7.42	1978	22	84	.77 -0.73 5.8			400	1758	4.41	1975	38	127	1.80 -1.68 7.4
		560	1976	7.31	2038	21	76	.70 -0.67 5.6			440	1826	4.20	2036	36	112	1.61 -1.51 7.1
10	600	360	1773	8.63	1872	32	155	1.42 -1.31 7.8			480	1886	4.00	2089	34	99	1.45 -1.37 6.7
		400	1874	8.50	1971	30	138	1.24 -1.15 7.6			520	1939	3.81	2137	33	88	1.32 -1.25 6.4
		440	1977	8.38	2062	28	124	1.10 -1.02 7.4	20	1000	360	1797	5.17	2056	42	162	2.17 -2.01 8.7
		480	2061	8.26	2147	27	112	.98 -0.92 7.2			400	1883	4.95	2132	40	142	1.92 -1.79 8.3
		520	2142	8.14	2224	26	101	.89 -0.83 7.0			440	1959	4.73	2199	38	126	1.72 -1.61 8.0
		560	2217	8.03	2296	24	92	.81 -0.76 6.8			480	2027	4.53	2260	37	112	1.56 -1.47 7.6
10	700	360	1924	9.70	2048	36	178	1.58 -1.45 8.9			520	2088	4.33	2315	35	100	1.42 -1.34 7.3
		400	2040	9.58	2157	34	159	1.39 -1.28 8.7			560	2143	4.15	2364	34	90	1.30 -1.23 7.0
		440	2147	9.47	2258	32	144	1.23 -1.15 8.5	20	1100	360	1907	5.71	2197	45	178	2.30 -2.14 9.6
		480	2245	9.35	2352	30	130	1.11 -1.04 8.3			400	1996	5.44	2279	43	157	2.05 -1.91 9.2
		520	2337	9.24	2439	29	119	1.01 -0.94 8.2			440	2081	5.26	2354	41	140	1.84 -1.72 8.9
		560	2422	9.13	2521	28	109	.92 -0.86 8.0			480	2156	5.06	2421	39	125	1.67 -1.57 8.5
10	800	360	2057	10.94	2207	39	200	1.74 -1.60 10.0			520	2225	4.86	2482	38	113	1.52 -1.44 8.2
		400	2182	10.83	2324	37	180	1.54 -1.42 9.8			560	2286	4.67	2537	36	102	1.40 -1.32 7.9
		440	2298	10.72	2433	36	163	1.37 -1.27 9.7	20	1200	360	1948	6.23	2331	48	195	2.44 -2.26 10.5
		480	2405	10.61	2535	34	149	1.24 -1.15 9.5			400	2100	6.01	2419	45	173	2.18 -2.02 10.1
		520	2505	10.51	2630	33	137	1.13 -1.05 9.3			440	2192	5.79	2499	43	154	1.96 -1.83 9.8
		560	2598	10.40	2719	32	126	1.03 -0.97 9.1			480	2275	5.58	2572	42	139	1.78 -1.67 9.4
10	900	360	2174	11.96	2353	43	221	1.90 -1.75 11.1			520	2359	5.38	2639	40	125	1.63 -1.53 9.1
		400	2307	11.85	2476	41	200	1.69 -1.55 10.9			560	2418	5.19	2720	39	114	1.50 -1.41 8.8
		440	2430	11.75	2591	39	183	1.51 -1.40 10.7	20	1300	360	2067	6.75	2459	50	211	2.57 -2.38 11.4
		480	2545	11.65	2699	38	168	1.37 -1.27 10.6			400	2198	6.53	2552	48	188	2.30 -2.14 11.0
		520	2652	11.55	2800	36	155	1.25 -1.16 10.4			440	2284	6.31	2637	46	169	2.08 -1.94 10.7
		560	2752	11.45	2895	35	144	1.15 -1.07 10.2			480	2384	6.10	2715	44	153	1.89 -1.77 10.3
10	1000	360	2278	13.15	2488	46	242	2.06 -1.89 12.1			520	2465	5.91	2787	43	139	1.74 -1.63 10.0
		400	2418	13.06	2617	44	220	1.83 -1.69 11.9			560	2539	5.72	2853	41	126	1.60 -1.51 9.6
		440	2548	12.96	2737	43	202	1.65 -1.52 11.8	20	1400	360	2149	7.26	2582	52	227	2.70 -2.49 12.3
		480	2668	12.87	2850	41	186	1.50 -1.39 11.6			400	2244	7.04	2679	50	203	2.43 -2.25 11.9
		520	2782	12.77	2956	40	173	1.37 -1.27 11.4			440	2338	6.83	2768	48	184	2.20 -2.05 11.5
		560	2888	12.68	3056	39	161	1.26 -1.18 11.3			480	2434	6.62	2851	47	167	2.01 -1.88 11.2
10	1100	360	2372	14.73	2614	49	263	2.22 -2.03 13.0			520	2571	6.42	2927	45	152	1.84 -1.73 10.8
		400	2514	14.64	2747	47	240	1.98 -1.82 12.9			560	2651	6.23	2998	44	139	1.70 -1.60 10.5
		440	2653	14.55	2872	46	221	1.77 -1.65 12.7	20	1500	360	2245	7.76	2760	55	243	2.83 -2.61 13.1
		480	2779	14.46	2989	44	205	1.63 -1.51 12.6			400	2345	7.55	2801	53	219	2.55 -2.36 12.7
		520	2897	14.37	3094	43	191	1.49 -1.39 12.4			440	2475	7.34	2894	51	198	2.32 -2.15 12.4
		560	3008	14.29	3203	42	178	1.38 -1.28 12.3			480	2576	7.13	2981	49	181	2.12 -1.98 12.0
10	1200	360	2608	16.20	2871	50	259	2.13 -1.95 13.8			520	2668	6.94	3061	48	165	1.95 -1.83 11.7
		400	2748	16.12	2999	49	240	1.93 -1.77 13.7			560	2751	6.75	3136	46	152	1.81 -1.70 11.4
		440	2879	16.04	3119	47	223	1.76 -1.62 13.6	20	1600	360	2315	8.26	2814	57	258	2.96 -2.72 13.9
		480	3001	15.95	3232	46	208	1.62 -1.50 13.4			400	2441	8.04	2918	55	234	2.67 -2.47 13.6
		520	3117	15.87	3340	45	195	1.50 -1.39 13.3			440	2566	7.84	3015	53	213	2.41 -2.26 13.2
10	1300	360	2649	18.25	2988	52	278	2.27 -2.08 14.8			480	2661	7.64	3109	51	195	2.23 -2.08 12.9
		400	2834	18.17	3111	51	258	2.06 -1.89 14.6			520	2758	7.45	3199	50	179	2.00 -1.92 12.6
		440	2969	18.09	3241	50	240	1.86 -1.74 14.5			560	2848	7.26	3267	48	165	1.91 -1.79 12.3
		480	3095	18.02	3357	49	225	1.74 -1.61 14.4	20	1700	360	2377	8.75	2925	59	274	3.08 -2.84 14.8
		520	3214	17.94	3467	48	212	1.61 -1.50 14.2			400	2511	8.54	3032	57	249	2.79 -2.58 14.4
10	1400	360	2917	20.21	3232	54	276	2.19 -2.01 15.5			440	2619	8.33	3132	55	227	2.55 -2.36 14.1
		400	3052	20.14	3357	53	258	2.01 -1.85 15.4			480	2740	8.14	3224	54	208	2.34 -2.18 13.7
		440	3181	20.06	3476	52	242	1.86 -1.72 15.3			520	2841	7.95	3311	52	192	2.17 -2.02 13.4
		480	3307	19.99	3588	51	228	1.73 -1.60 15.2			560	2936	7.76	3392	51	178	2.01 -1.88 13.1

DIVE ANGLE	ALT ABOVE TGT	TAS	ROMP RANGE	TIME OF FLIGHT	SLANT RANGE FROM REL	IMPACT ANGLE	SIGHT DEP FROM FLIGHT PATH	WIND CORRECTION FACTORS
DEG	FT	KTS	FT	SEC	FT	DEG	MILS	HEAD TAIL MILS/KNOT
10	1510	520	3260	9.60	1598	54	259	1.98 -1.83 16.2
		560	3385	9.53	1702	53	245	1.85 -1.70 16.1
20	700	360	1415	3.54	1579	74	114	1.76 -1.65 6.0
		430	1472	3.43	1610	33	98	1.40 -1.30 5.4
		440	1521	3.14	1675	31	96	1.38 -1.30 5.3
20	800	360	1555	4.09	1748	37	118	1.90 -1.77 6.9
		430	1622	3.87	1804	35	113	1.67 -1.57 6.5
		440	1680	3.66	1861	33	98	1.49 -1.40 6.2
		480	1771	3.47	1907	32	87	1.34 -1.27 5.9
20	900	360	1681	4.63	1907	40	146	2.03 -1.89 7.8
		400	1758	4.41	1975	38	127	1.80 -1.68 7.4
		440	1826	4.20	2036	36	112	1.61 -1.51 7.1
		480	1886	4.00	2089	34	99	1.45 -1.37 6.7
		520	1939	3.81	2137	33	88	1.32 -1.25 6.4
20	1000	360	1797	5.17	2056	42	162	2.17 -2.01 8.7
		400	1883	4.95	2132	40	142	1.92 -1.79 8.3
		440	1959	4.73	2199	38	126	1.72 -1.61 8.0
		480	2027	4.53	2260	37	112	1.56 -1.47 7.6
		520	2088	4.33	2315	35	100	1.42 -1.34 7.3
		560	2143	4.15	2364	34	90	1.30 -1.23 7.0

MK-82 (SNAKEYE I) AND MK-36 - HIGH DRAG										DIVE ANGLE		ALT ABOVE TGT		IAS		DOPPLER RANGE		TIME OF FLIGHT		SLANT RANGE		IMPACT ANGLE		SIGHT DEP FLIGHT PATH		WIND CORRECTION FACTORS		
DIVE ANGLE	ALT ABOVE TGT	IAS	DOPPLER RANGE	TIME OF FLIGHT	SLANT RANGE FROM REL	IMPACT ANGLE	SIGHT DEP FLIGHT PATH	WIND CORRECTION FACTORS			DEG	FT	KTS	FT	SEC	REL	FT	DEG	MILS	HEAD	TAIL	GROSS						
DEG	FT	KTS	FT	SEC	FT	DEG	MILS	HEAD	TAIL	GROSS	DEG	FT	KTS	FT	SEC	REL	FT	DEG	MILS	MILS/KNCT	FT/KT							
20	1800	360	2441	9.23	3373	61	289	3.20	-2.95	15.6	30	2200	360	2224	9.27	3171	65	258	3.66	-3.41	15.6							
		400	2576	9.62	3142	59	263	2.91	-2.69	15.2			400	2341	9.95	3213	63	233	3.35	-3.13	15.1							
		440	2699	9.82	3244	57	241	2.66	-2.47	14.9			440	2441	9.65	3288	62	211	3.09	-2.89	14.6							
		480	2817	9.62	3339	56	222	2.45	-2.28	14.6			480	2537	9.47	3358	60	193	2.86	-2.68	14.1							
		520	2914	9.44	3429	54	206	2.27	-2.12	14.2			520	2627	9.10	3423	58	176	2.66	-2.50	13.7							
		560	3017	9.26	3513	53	191	2.12	-1.98	13.9			560	2700	8.84	3483	57	162	2.48	-2.34	13.2							
20	1900	360	2497	9.70	3138	62	304	3.32	-3.05	16.4	30	2300	360	2275	9.71	3235	66	270	3.75	-3.49	16.4							
		400	2637	9.50	3250	61	278	3.02	-2.79	16.0			400	2392	9.19	3319	65	244	3.45	-3.22	15.9							
		440	2764	9.56	3358	59	255	2.77	-2.57	15.7			440	2499	9.10	3396	63	223	3.18	-2.98	15.4							
		480	2882	9.11	3452	58	236	2.56	-2.38	15.4			480	2595	8.81	3468	62	204	2.95	-2.77	14.9							
		520	2991	8.93	3543	56	219	2.38	-2.21	15.1			520	2684	8.54	3535	60	187	2.75	-2.59	14.4							
		560	3097	8.75	3629	55	204	2.22	-2.07	14.8			560	2765	8.28	3597	59	172	2.57	-2.42	14.0							
20	2000	360	2551	10.17	3241	64	318	3.43	-3.15	17.2	30	2400	360	2319	10.15	3388	68	281	3.86	-3.58	17.1							
		400	2693	9.97	3355	62	292	3.13	-2.89	16.8			400	2419	9.63	3423	66	256	3.58	-3.30	16.6							
		440	2874	9.78	3461	61	269	2.88	-2.67	16.5			440	2550	9.54	3502	64	234	3.27	-3.06	16.1							
		480	2945	9.59	3560	60	250	2.67	-2.47	16.2			480	2650	9.25	3575	63	214	3.04	-2.85	15.6							
		520	3058	9.41	3658	59	232	2.48	-2.31	15.9			520	2742	8.98	3644	62	197	2.84	-2.67	15.2							
		560	3162	9.23	3742	57	217	2.32	-2.16	15.6			560	2827														

8. WEAPONS AND ARMAMENT

Cluster Munitions

WEAPON	TYPE
CBU-1/A	Anti personnel cluster munition
CBU-2/A	Anti materiel cluster munition
CBU-2B/A	Anti materiel cluster munition

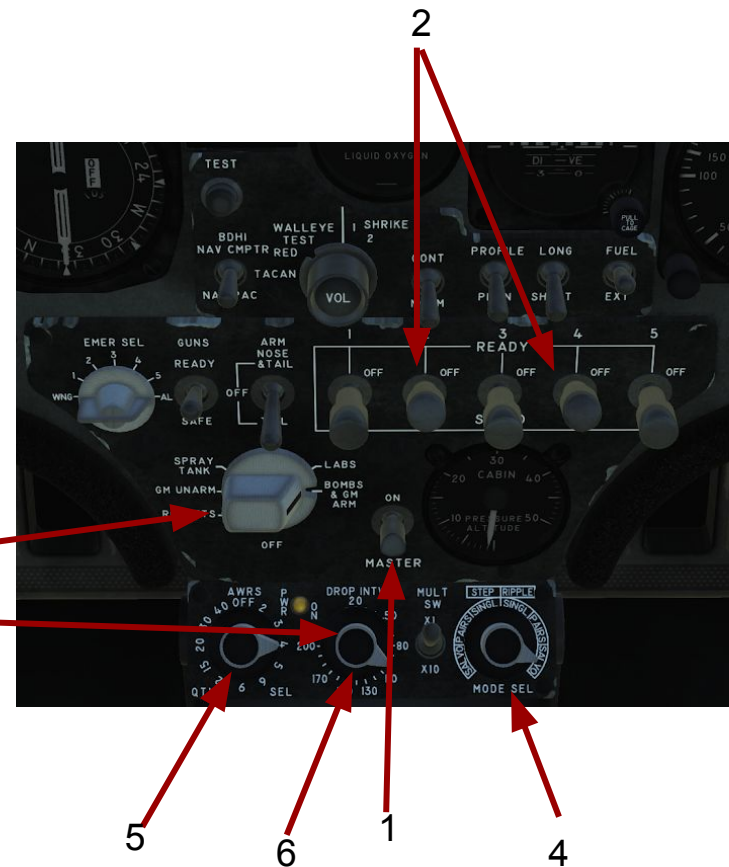


8. WEAPONS AND ARMAMENT

Cluster Munitions - Salvo Release

1. Master Arm to ON
2. Select hardpoint with desired bombs (2 and 4 in this case)
3. Weapon selector dial to Bombs & GM Arm
4. Select release type - salvo ripple
5. Select salvo number
6. Set Desired Interval
7. Hold Pickle for duration of weapon drops

To set more per salvo, use the x10 switch



8. WEAPONS AND ARMAMENT

Rockets	
WEAPON	TYPE
LAU-10 - 4* Zuni MK71	5in High Explosive (?)
LAU-3 - 19 * FFAR M156	2.75in White Phosphorus
LAU-3 - 19 * FFAR Mk1	2.75in High Explosive
LAU-3 - 19 * FFAR Mk5	2.75in High Explosive Anti Tank
LAU-68 - 7 * 2.75in Rockets M257	2.75in Parachute Illumination
LAU-68 7 * 2.75in rockets MK5	2.75in High Explosive



8. WEAPONS AND ARMAMENT

Rockets - Pairs Release

1. Master Arm to ON
2. Select hardpoint with desired rockets (3 in this case)
3. Weapon selector dial to ROCKETS
4. Select release type - step pairs
5. Pull trigger when ready

Note: Be sure to set GUNS to SAFE to prevent firing both rockets and guns simultaneously

Note: Single/Pairs/Ripple/Salvo operate the same as with bombs.



Rockets - Depression Tables

The depression tables for the 2.75' FFAR Rockets follow

ALT ABOVE TGT FT	KCAS	DIVE ANGLE DEG	TIME OF FLT SEC	AIRCRAFT GROSS WEIGHT - THOUSANDS OF POUNDS												WIND CORRECTION FACTORS		
				12.0	14.0	16.0	18.0	20.0	12.0	16.0	20.0	12.0	16.0	20.0	- FT	FT/KT	MIL/KT	
				SIGHT SETTING - MILS					SLANT RANGE - FEET			HORIZONTAL RANGE - FT						
NEG SETTING INDICATES ELEV																		
900	360	10	2.30	38	42	47	52	56	4566	4623	4682	4476	4535	4594	4	.2		
900	400	10	2.25	31	34	38	42	46	4565	4606	4648	4475	4517	4560	4	.2		
900	440	10	2.20	25	28	31	34	37	4574	4605	4636	4485	4516	4548	4	.2		
900	480	10	2.16	20	23	25	28	30	4588	4611	4634	4499	4522	4549	4	.2		
900	520	10	2.12	16	18	20	22	24	4604	4622	4639	4515	4533	4551	4	.2		
900	560	10	2.08	13	15	16	18	20	4623	4636	4650	4535	4548	4562	4	.1		
1250	360	10	3.02	42	46	51	56	60	6207	6281	6356	6080	6155	6232	5	.2		
1250	400	10	2.94	35	38	42	46	50	6211	6264	6318	6084	6138	6193	5	.2		
1250	440	10	2.88	29	32	35	38	41	6227	6267	6307	6100	6141	6182	5	.2		
1250	480	10	2.82	24	26	29	31	34	6250	6279	6309	6124	6154	6184	5	.2		
1250	520	10	2.77	20	22	24	26	28	6275	6298	6321	6149	6172	6196	5	.1		
1250	560	10	2.72	16	18	20	21	23	6303	6321	6338	6178	6196	6213	5	.1		
1250	360	15	2.24	36	41	45	50	54	4448	4486	4524	4269	4308	4346	4	.2		
1250	400	15	2.19	29	33	37	40	44	4447	4479	4502	4268	4296	4325	4	.2		
1250	440	15	2.14	24	27	30	33	36	4453	4474	4494	4274	4295	4317	4	.2		
1250	480	15	2.10	19	21	24	26	29	4463	4478	4493	4284	4309	4315	4	.2		
1250	520	15	2.06	15	17	19	21	23	4473	4485	4496	4295	4307	4319	3	.2		
1250	560	15	2.03	12	13	15	17	19	4485	4494	4503	4308	4317	4326	3	.2		
1500	360	15	2.59	38	43	47	52	56	5299	5343	5388	5082	5128	5175	4	.2		
1500	400	15	2.53	31	35	39	42	46	5299	5331	5364	5083	5116	5150	4	.2		
1500	440	15	2.48	26	29	32	35	38	5308	5331	5355	5091	5116	5141	4	.2		
1500	480	15	2.43	21	23	26	28	31	5320	5337	5355	5104	5122	5140	4	.2		
1500	520	15	2.38	17	19	21	23	25	5333	5347	5360	5118	5132	5146	4	.2		
1500	560	15	2.34	13	15	17	18	20	5349	5359	5369	5134	5145	5155	4	.2		
1750	360	15	2.96	40	45	49	54	58	6137	6187	6238	5882	5935	5988	5	.2		
1750	400	15	2.84	33	37	41	44	48	6140	6176	6213	5885	5921	5961	5	.2		
1750	440	15	2.83	27	30	33	36	40	6151	6178	6205	5897	5925	5953	5	.2		
1750	480	15	2.77	23	25	28	30	33	6166	6186	6206	5913	5933	5954	5	.2		
1750	520	15	2.72	18	20	23	25	27	6183	6198	6214	5930	5946	5962	5	.2		
1750	560	15	2.67	15	17	18	20	22	6202	6213	6225	5950	5962	5974	5	.2		
1900	360	20	2.11	34	38	43	47	52	4140	4166	4192	3859	3887	3915	4	.3		
1900	400	20	2.06	27	31	34	38	42	4139	4158	4177	3858	3876	3899	3	.3		
1900	440	20	2.02	22	25	28	31	34	4144	4157	4171	3862	3877	3892	3	.3		
1900	480	20	1.98	17	20	22	25	27	4150	4160	4170	3869	3880	3891	3	.3		
1900	520	20	1.94	13	15	17	19	21	4157	4165	4173	3877	3885	3894	3	.3		
1900	560	20	1.91	10	12	13	15	17	4165	4171	4177	3885	3892	3898	3	.3		
1750	360	20	2.37	36	40	44	49	53	4810	4840	4870	4480	4512	4545	4	.3		
1750	400	20	2.32	29	32	36	39	43	4810	4831	4853	4488	4503	4527	4	.3		
1750	440	20	2.27	24	26	29	32	35	4815	4831	4847	4486	4503	4520	4	.3		
1750	480	20	2.23	19	21	23	26	28	4823	4835	4846	4494	4507	4519	4	.3		
1750	520	20	2.18	15	17	19	21	23	4831	4841	4850	4503	4513	4523	4	.3		
1750	560	20	2.15	11	13	15	16	18	4841	4848	4855	4514	4521	4529	4	.3		

8. WEAPONS AND ARMAMENT

ALT ABOVE TGT FT	KCAS	DIVE ANGLE DEG	TIME OF FLT SEC	AIRCRAFT GROSS WEIGHT - THOUSANDS OF POUNDS										WIND CORRECTIONS FACTORS		
				12.0	14.0	16.0	18.0	20.0	12.0	16.0	20.0	12.0	16.0	20.0	FT/KT	MIL/KT
				SIGHT SETTING - MILS					SLANT RANGE - FEET			HORIZONTAL RANGE - FT				
				NEG	SETTING	INDICATES	ELEV									
2000	360	20	2.65	37	41	46	50	55	5475	5500	5542	5096	5132	5169	4	.3
2000	400	20	2.59	39	34	37	41	44	5475	5500	5524	5097	5123	5149	4	.3
2000	440	20	2.53	25	27	30	33	36	5482	5500	5518	5104	5124	5143	4	.3
2000	480	20	2.46	20	22	25	27	30	5492	5505	5518	5115	5129	5143	4	.3
2000	520	20	2.44	16	18	20	22	24	5502	5512	5523	5126	5137	5148	4	.3
2000	560	20	2.39	12	14	16	17	19	5513	5521	5528	5138	5146	5154	4	.3
2000	360	30	1.99	29	33	37	41	45	3870	3884	3899	3313	3330	3347	3	.4
2000	400	30	1.95	27	29	30	33	36	3870	3880	3890	3313	3329	3337	3	.4
2000	440	30	1.91	18	21	23	26	29	3872	3880	3887	3315	3324	3333	3	.4
2000	480	30	1.87	14	16	18	21	23	3875	3881	3887	3319	3326	3333	3	.4
2000	520	30	1.84	10	12	14	16	18	3879	3884	3888	3324	3329	3334	3	.4
2000	560	30	1.81	7	9	10	11	13	3884	3887	3890	3329	3333	3336	3	.4
2250	360	30	2.17	36	34	36	42	46	4346	4362	4378	3718	3737	3750	4	.4
2250	400	30	2.13	24	27	31	36	37	4346	4357	4369	3718	3737	3745	4	.4
2250	440	30	2.08	19	22	24	27	30	4349	4357	4366	3721	3735	3742	4	.4
2250	480	30	2.04	15	17	19	21	24	4353	4359	4365	3726	3734	3741	3	.4
2250	520	30	2.00	11	13	15	17	18	4357	4362	4367	3731	3737	3742	3	.4
2250	560	30	1.97	7	9	10	12	13	4362	4365	4369	3737	3740	3745	3	.4
2500	360	30	2.36	31	35	39	43	47	4821	4838	4856	4122	4140	4163	4	.4
2500	400	30	2.31	25	28	31	35	38	4821	4834	4846	4122	4137	4152	4	.4
2500	440	30	2.26	21	22	25	28	31	4824	4834	4843	4126	4137	4148	4	.4
2500	480	30	2.21	15	18	20	22	24	4829	4836	4843	4132	4140	4148	4	.4
2500	520	30	2.17	12	14	16	17	19	4834	4840	4845	4138	4144	4150	4	.4
2500	560	30	2.13	8	9	11	12	14	4839	4843	4847	4143	4148	4153	4	.4
2750	360	30	2.55	32	36	40	44	48	5294	5313	5333	4523	4546	4569	4	.4
2750	400	30	2.49	26	29	32	36	39	5294	5304	5322	4524	4541	4557	4	.4
2750	440	30	2.44	21	23	26	29	31	5299	5309	5319	4529	4541	4553	4	.4
2750	480	30	2.39	16	18	21	23	25	5304	5312	5319	4535	4544	4553	4	.4
2750	520	30	2.35	13	14	16	18	20	5310	5316	5322	4542	4549	4556	4	.4
2750	560	30	2.30	8	10	11	13	14	5315	5319	5324	4548	4553	4558	4	.4
3000	360	30	2.75	33	37	41	45	49	5765	5786	5807	4924	4948	4972	5	.4
3000	400	30	2.69	27	30	33	36	40	5767	5782	5797	4925	4942	4960	5	.4
3000	440	30	2.63	21	24	27	30	32	5771	5783	5794	4930	4943	4957	4	.4
3000	480	30	2.58	17	19	21	24	26	5775	5786	5794	4938	4947	4957	4	.4
3000	520	30	2.52	13	15	17	19	21	5784	5791	5797	4946	4953	4961	4	.4
3000	560	30	2.48	9	10	12	13	15	5790	5794	5799	4952	4957	4963	4	.4
3500	360	30	3.16	35	39	43	47	51	6784	6728	6752	5718	5746	5774	5	.4
3500	400	30	3.09	28	32	35	38	42	6786	6723	6741	5721	5741	5761	5	.4
3500	440	30	3.02	23	26	29	31	34	6713	6725	6738	5728	5743	5758	5	.4
3500	480	30	2.96	19	21	23	25	28	6721	6730	6739	5737	5748	5759	5	.4
3500	520	30	2.90	15	17	19	21	22	6729	6737	6744	5748	5756	5765	5	.4
3500	560	30	2.84	9	11	12	14	15	6735	6740	6745	5754	5760	5766	5	.4
4000	360	30	3.50	37	41	45	49	53	7635	7662	7689	6563	6535	6566	6	.4
4000	400	30	3.52	30	34	37	40	44	7639	7658	7678	6568	6531	6553	6	.4
4000	440	30	3.44	25	28	30	33	36	7647	7662	7675	6518	6535	6551	6	.4
4000	480	30	3.36	20	23	25	27	29	7657	7668	7678	6530	6542	6554	6	.4
4000	520	30	3.29	17	19	20	22	24	7664	7677	7685	6543	6552	6562	6	.4
4000	560	30	3.23	10	12	13	15	16	7675	7680	7686	6550	6556	6563	6	.4

8. WEAPONS AND ARMAMENT

ALT ABOVE TGT FT	KCAS	DIVE ANGLE DEG	TIME OF FLT SEC	AIRCRAFT GROSS WEIGHT - THOUSANDS OF POUNDS					WIND CORRECTIONS FACTORS							
				12.0	14.0	16.0	18.0	20.0	12.0	16.0	20.0					
				SIGHT SETTING - MILS NEG SETTING INDICATES ELEV					SLANT RANGE - FEET		HORIZONTAL RANGE - FT		FT/KT	MIL/KT		
900	360	10	2.24	37	41	46	51	55	4594	4648	4704	4505	4560	4617	4	.2
900	400	10	2.19	29	33	37	41	44	4594	4633	4673	4505	4545	4586	4	.2
900	440	10	2.14	23	27	30	33	36	4603	4631	4660	4514	4543	4573	4	.2
900	480	10	2.10	18	21	24	26	29	4616	4638	4659	4528	4549	4571	4	.1
900	520	10	2.06	15	17	19	21	23	4633	4649	4665	4544	4561	4578	3	.1
900	560	10	2.02	7	8	10	12	13	4636	4648	4660	4548	4560	4572	3	.1
1250	360	10	2.91	40	45	50	54	59	6254	6325	6398	6128	6201	6274	5	.2
1250	400	10	2.84	33	37	40	44	48	6259	6311	6363	6133	6186	6239	5	.2
1250	440	10	2.78	27	30	33	36	39	6275	6313	6350	6149	6188	6226	5	.1
1250	480	10	2.72	22	24	27	29	32	6297	6325	6353	6172	6200	6229	5	.1
1250	520	10	2.67	18	20	22	24	26	6322	6343	6364	6197	6219	6240	5	.1
1250	560	10	2.62	9	11	12	14	16	6328	6343	6359	6203	6219	6235	4	.1
1250	360	15	2.18	35	40	44	49	53	4466	4502	4539	4288	4325	4363	4	.2
1250	400	15	2.13	28	32	35	39	43	4466	4492	4519	4288	4315	4342	4	.2
1250	440	15	2.08	22	25	28	31	34	4472	4491	4510	4294	4313	4333	4	.2
1250	480	15	2.04	17	20	22	25	27	4481	4495	4509	4303	4318	4332	3	.2
1250	520	15	2.00	13	15	17	19	21	4491	4502	4513	4314	4325	4336	3	.2
1250	560	15	1.96	5	7	8	10	12	4492	4500	4508	4315	4323	4331	3	.2
1500	360	15	2.51	37	41	46	51	55	5323	5365	5408	5107	5151	5195	4	.2
1500	400	15	2.45	30	33	37	41	45	5324	5355	5386	5109	5140	5173	4	.2
1500	440	15	2.40	24	27	30	33	36	5332	5354	5377	5117	5140	5163	4	.2
1500	480	15	2.35	19	21	24	26	29	5344	5360	5377	5129	5146	5164	4	.2
1500	520	15	2.30	15	17	19	21	23	5357	5369	5382	5143	5155	5168	4	.2
1500	560	15	2.26	6	8	9	11	13	5358	5367	5376	5144	5153	5163	4	.2
1750	360	15	2.85	39	43	48	53	57	6169	6217	6265	5915	5965	6016	5	.2
1750	400	15	2.78	31	35	39	43	46	6172	6207	6242	5919	5955	5992	5	.2
1750	440	15	2.72	26	29	32	35	38	6183	6208	6233	5930	5956	5983	5	.2
1750	480	15	2.67	21	23	26	28	31	6197	6216	6235	5945	5965	5985	5	.2
1750	520	15	2.62	16	18	20	22	24	6212	6226	6240	5961	5975	5990	4	.2
1750	560	15	2.56	7	9	11	12	14	6215	6225	6236	5964	5974	5985	4	.2
1500	360	20	2.06	33	37	42	46	51	4152	4177	4201	3872	3898	3925	3	.3
1500	400	20	2.01	26	30	33	37	40	4152	4170	4188	3872	3891	3910	3	.3
1500	440	20	1.97	20	23	26	29	32	4156	4169	4182	3876	3890	3903	3	.3
1500	480	20	1.93	16	18	21	23	25	4162	4171	4181	3882	3892	3903	3	.3
1500	520	20	1.89	12	14	16	17	19	4169	4176	4183	3889	3897	3905	3	.3
1500	560	20	1.85	3	5	6	8	10	4168	4174	4179	3889	3895	3900	3	.3

8. WEAPONS AND ARMAMENT

ALT ABOVE TGT FT	KCAS	DIVE ANGLE DEG	TIME OF FLT SEC	AIRCRAFT GROSS WEIGHT - THOUSANDS OF POUNDS						WIND CORRECTIONS FACTORS					
				12.0	14.0	16.0	18.0	20.0	12.0	16.0	20.0	12.0	16.0	20.0	
				SIGHT SETTING - MILS NEG SETTING INDICATES ELEV						SLANT RANGE - FEET		HORIZONTAL RANGE - FT		FT/KT	MIL/KT
1750	360	20	2.31	34	39	43	48	52	4825	4853	4882	4496	4527	4557	4 .3
1750	400	20	2.25	27	31	35	38	42	4826	4846	4867	4497	4519	4541	4 .3
1750	440	20	2.20	22	29	28	30	33	4831	4845	4860	4503	4518	4534	4 .3
1750	480	20	2.16	17	19	22	24	27	4838	4849	4860	4510	4522	4534	4 .3
1750	520	20	2.12	13	14	16	18	20	4846	4854	4862	4519	4527	4536	4 .3
1750	560	20	2.08	4	6	7	9	10	4846	4852	4858	4519	4525	4532	4 .3
2000	360	20	2.56	36	40	45	49	53	5493	5525	5557	5116	5150	5185	4 .3
2000	400	20	2.50	29	32	36	39	43	5495	5518	5541	5118	5143	5168	4 .3
2000	440	20	2.45	23	26	29	32	35	5501	5518	5535	5125	5143	5161	4 .3
2000	480	20	2.40	18	21	23	25	28	5510	5523	5535	5135	5148	5161	4 .3
2000	520	20	2.35	13	15	17	19	21	5519	5528	5537	5144	5153	5163	4 .3
2000	560	20	2.30	5	6	8	9	11	5519	5526	5533	5144	5152	5159	4 .3
2000	360	30	1.94	28	32	36	41	45	3876	3890	3904	3321	3336	3352	3 .4
2000	400	30	1.90	22	25	29	32	35	3876	3886	3896	3321	3332	3344	3 .4
2000	440	30	1.86	17	19	22	25	28	3879	3886	3893	3323	3331	3340	3 .4
2000	480	30	1.83	12	15	17	19	21	3882	3887	3893	3327	3333	3339	3 .4
2000	520	30	1.79	8	10	12	13	15	3885	3889	3893	3331	3335	3340	3 .4
2000	560	30	1.76	-0	1	3	4	6	3884	3887	3890	3330	3333	3337	3 .4
2250	360	30	2.12	29	33	37	41	46	4354	4369	4384	3727	3745	3763	4 .4
2250	400	30	2.07	23	26	29	33	36	4354	4365	4376	3728	3740	3753	3 .4
2250	440	30	2.02	18	20	23	26	28	4357	4365	4372	3731	3740	3749	3 .4
2250	480	30	1.98	13	15	18	20	22	4360	4366	4372	3735	3742	3749	3 .4
2250	520	30	1.95	8	10	12	14	15	4364	4368	4372	3739	3744	3749	3 .4
2250	560	30	1.91	-0	1	3	4	6	4363	4366	4370	3738	3742	3746	3 .4
2500	360	30	2.29	30	34	38	42	46	4830	4846	4863	4132	4152	4171	4 .4
2500	400	30	2.24	24	27	30	34	37	4830	4843	4855	4133	4147	4161	4 .4
2500	440	30	2.19	18	21	24	26	29	4834	4842	4851	4137	4147	4157	4 .4
2500	480	30	2.15	14	16	18	21	23	4838	4845	4851	4142	4150	4157	4 .4
2500	520	30	2.10	9	11	12	14	16	4841	4846	4851	4146	4151	4157	4 .4
2500	560	30	2.06	0	2	3	5	6	4841	4845	4848	4145	4150	4154	3 .4

8. WEAPONS AND ARMAMENT

Air-to-Air Munitions

WEAPON	TYPE
AIM-9p5	Short-range, all-aspect annular blast-frag missile
GAR-8	Early model AIM-9 with USAF Nomenclature



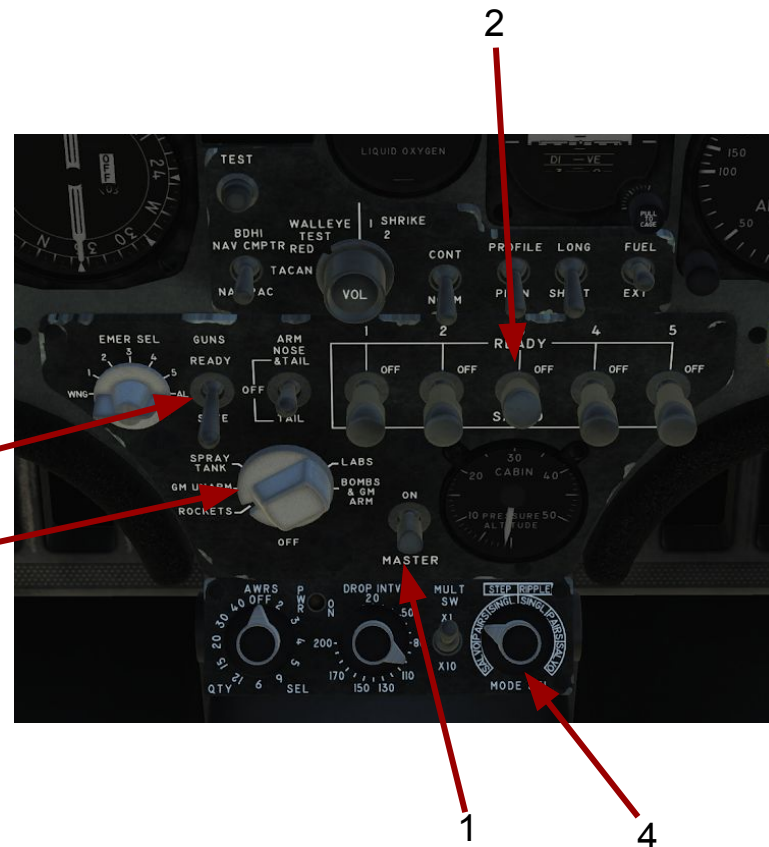
8. WEAPONS AND ARMAMENT

AA Missiles

1. Master Arm to ON
2. Select hardpoint with desired missile(2 and 4 are available)
3. Weapon selector dial to BOMBS & GM ARM
4. Select release type (In this case single)
5. Pull trigger when tone changes to high pitch

Note: Be sure to set GUNS to SAFE to prevent firing both missile and guns simultaneously

Note: Single/Pairs operate the same as with bombs.



8. WEAPONS AND ARMAMENT

Air-to-Ground Missile

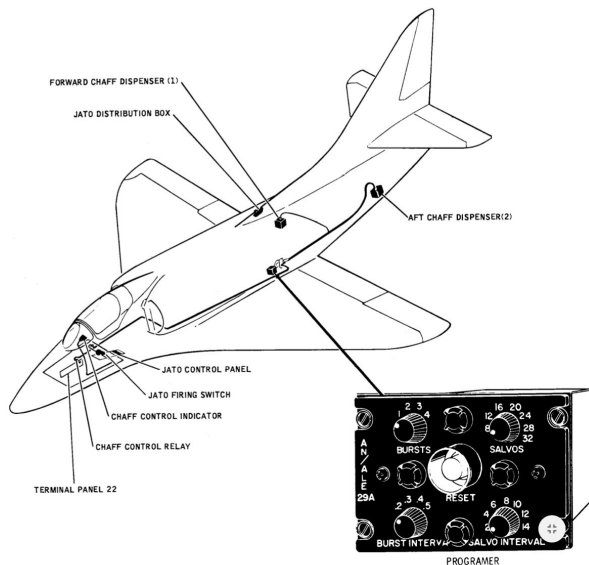
WEAPON	TYPE
AGM-45A "Shrike"	Anti-Radiation Missile



AA Missiles

Countermeasures

The A-4E-C comes equipped with an AN/ALE Chaff Dispenser loaded with two banks of countermeasures loaded with 30 chaff(flares?) as standard, located fore and aft.



9. COUNTERMEASURES

Countermeasures

To arm countermeasures:

1. Turn power on to unit
2. Press countermeasures release to dispense

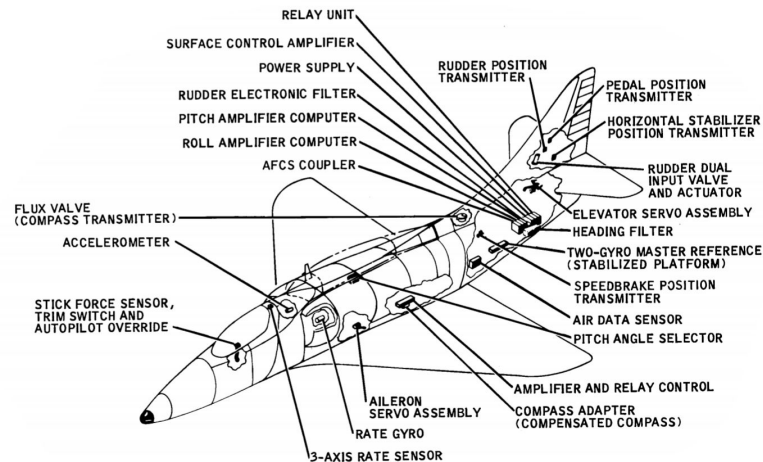
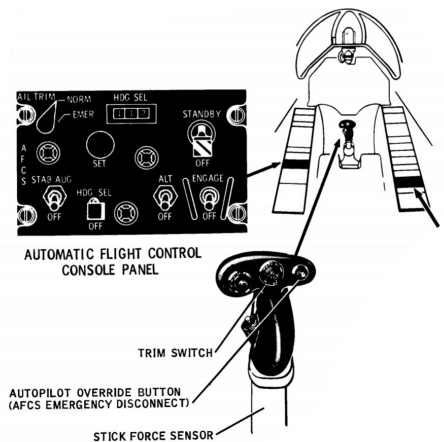


1



Autopilot - Systems

The A-4E-C has several autopilot measures available to the pilot, these are contained within the AFCS - the Automatic Flight Control System.



10. Autopilot

When this switch is placed in the OFF position, all toggle switches on the panel return to the OFF position.



Autopilot - Systems

Movement of the engage switch to the ENGAGE position turns on the AFCS in one of two modes; attitude hold or heading hold, depending on flight attitude.

In addition, the pilot can further select anyone of three modes: control stick steering, altitude hold, and/or heading hold.

The switch may be placed in the OFF position at any time.

The switch should not be placed in ENGAGE position until the standby switch has been in STANDBY position for 30 seconds.

The AFCS will not engage until the all attitude indicator OFF flag disappears.

Engage Switch



All attitude indicator flag



Autopilot - Systems

When this switch is placed in the OFF position both the heading select switch and the altitude switch return to the OFF position.

An abrupt lateral stick force of 40 pounds causes the aileron servo to bypass, which effectively disengages the AFCS lateral controls.

The engage switch does not move from the ENGAGE position. Lateral control of the aircraft is then provided by the normal control system.

To re-engage the lateral servo, cycle the engage switch to the OFF position and then return to the ENGAGE position. This operation may be performed at any time.

Pressing the AFCS override button (AP) on the control stick causes the mode switches to move automatically to the OFF position. The AFCS can be re-engaged by moving the engage switch to ENGAGE.

Engage Switch



All attitude indicator flag



Autopilot - Systems

HEADING SELECT SWITCH

Movement of the heading select switch to the HDG SEL position starts the aircraft turning by the shortest route toward the heading selected on the heading select indicator by use of the SET knob.

The heading select switch may be placed in the OFF position at any time. If placed in the OFF position prior to the completion of a turn, the aircraft will roll smoothly to a level attitude and maintain the compass heading indicated at that time.

SET Knob

Heading Select Switch



Autopilot - Systems

If the SET knob is used to change the heading on the indicator while the switch is in the HDG SEL position, the following can occur:

1. If the aircraft is in level flight, sudden SET knob movement will result in abrupt aircraft lateral movement. If the SET knob is moved very slowly, small heading changes can be made satisfactorily.
2. If the aircraft is already in a preselect heading turn, the SET knob may be moved at any rate if the new selected heading is in the same direction as the turn and is less than 180 degrees away from the compass heading at the time of selection. Selection of a heading reciprocal to the present aircraft heading will cause the aircraft to reverse the turn abruptly.

The HDG SEL switch will automatically move to the OFF position if the control stick steering mode is engaged.

Upon engaging the HDG SEL switch, the approximate pitch attitude will be maintained during the turn. If a level turn is desired, the altitude hold mode should be engaged by moving the altitude switch to ALT.

SET Knob

Heading Select Switch



Autopilot - Systems

ALTITUDE SWITCH

Movement of the altitude switch to the ALT position causes the aircraft to maintain the barometric altitude at actuation.

If the mode is engaged in a climb or dive, the aircraft will return to the barometric altitude existing at the time of altitude switch engagement.

The altitude switch cannot be engaged in climbs or descents in excess of 4000 feet per minute.

The mode cannot be engaged if any force is being applied to the control stick.

The switch will move automatically to the OFF position whenever control stick steering mode is engaged.

Altitude Switch



Autopilot - Systems

STABILITY AUGMENTATION SWITCH

Yaw damping action is provided when the engage switch is in the ENGAGE position or the stability augmentation switch is in the STAB AUG position.

AILERON TRIM NORM-EMERGENCY SWITCH

The aileron trim switch has two positions NORM and EMER. This switch is usually in the NORM position, but may be placed in the EMER position to provide aileron trim after the AFCS is disengaged, if aileron trim is not available in NORM.

Movement of this switch to the EMER position also disengages and prevents reengagement of the AFCS, except stability augmentation, while in the EMER position.

The AFCS can be re-engaged after placing the switch in the NORM position.

Stability Augmentation Switch

Aileron Trim
Norm-Emergency Switch



Autopilot - Modes of Operation

Modes of operation:

CONTROL STICK STEERING (CSS) MODE

The CSS mode provides for longitudinal and lateral control of the aircraft through the AFCS by pilot movement of the stick as in normal flight.

This mode is engaged regardless of other modes selected or in operation by applying a force on the control stick grip of 2 pounds or more.

Preselect heading and altitude hold modes are disengaged by use of CSS and they must be re-engaged to be used again. The AFCS reverts from CSS mode to either attitude hold or heading hold mode when pilot force on the control stick is reduced below 2 pounds.



Autopilot - Modes of Operation

The aircraft is controllable in all attitudes in CSS throughout the AFCS flight envelope, which is $4\pm 1/2$ positive-g, $1-1/2\pm 1/2$ negative-g, and one-half aileron deflection left or right.

If these limits are exceeded, the AFCS disengages.

The AFCS will not switch out of CSS at bank angles exceeding 70 degrees or pitch angles exceeding 60 degrees nose-up or nose-down unless limits of acceleration or aileron deflection are exceeded.



Autopilot - Modes of Operation

ATTITUDE HOLD MODE

With an aircraft bank angle between 5 degrees and 70 degrees and a pitch angle less than 60 degrees nose-up or nose-down, the aircraft lateral and longitudinal attitude at time of engagement of the AFCS or reversion from the CSS mode will be maintained.

HEADING HOLD MODE

If the pitch angle is within 60 degrees nose-up or nose-down and the bank angle of the aircraft is less than 5 degrees upon engagement of the AFCS or reversion from CSS mode, the aircraft will be rolled to a level attitude and the heading and pitch angles at that time will be maintained.



Autopilot

PRESELECT HEADING MODE

Upon engagement of this mode after the heading has been preselected on the indicator, the aircraft will roll into a smooth turn to the preselected heading and then roll out on this heading.

The turn will always be in the direction of the shortest route to the preselected heading. The bank angle will be maintained at 27 ± 5 degrees under all conditions.

NOTE: The fixed bank angle of 27 ± 5 degrees may cause the aircraft to buffet in an approach to stall if the preselect heading mode is selected below airspeeds ranging from 160 KIAS at 10,000 feet to 200 KIAS at 40,000 feet.



Autopilot - Modes of Operation

STABILITY AUGMENTATION MODE

The stability augmentation mode provides rudder yaw damping action which is that of pilot movement of the rudder pedals.

The mode can be selected at any time without other AFCS functions. It is also in operation automatically during all other AFCS functions.

The pilot must trim the aircraft directionally while using the AFCS in the same manner as he would when on the normal flight control system. If the aircraft is out of trim directionally, the following will occur:

1. A lateral engage transient will occur during change to the control stick steering mode.
2. The aircraft will be in a steady heading sideslip in the heading hold mode.



Autopilot - Modes of Operation

ALTITUDE HOLD MODE

The altitude hold mode may be engaged when the rate-of-change of altitude is less than 4000 ± 500 feet per minute.

The aircraft will maintain the altitude at engagement. The aircraft automatically will pull out of its climb or dive and return to and maintain the engage altitude.



Nav Setup Procedure : AN/ASN - 41

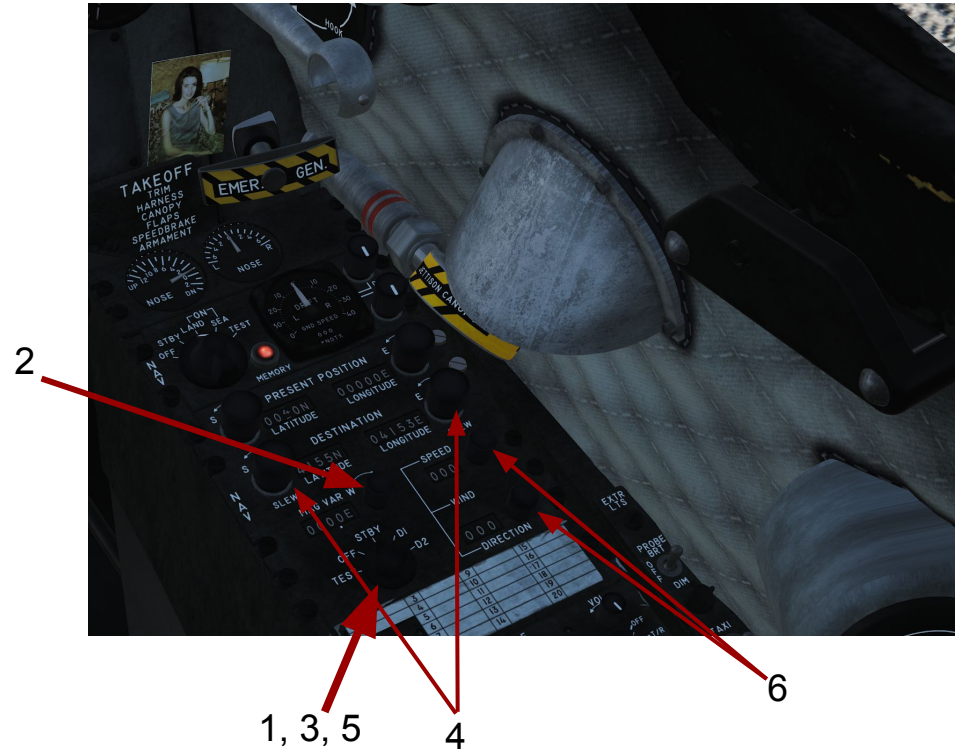
1. Set AN/ANS-41 DNS waypoint selector to STBY and wait 5 mins
2. Set magnetic var (6°E for Caucasus, 12°E for NTTR, 8°E for Normandy, 1.6° E for Persian Gulf)

To save waypoints:

3. Set waypoint selector to D2 (present position will be set, and set as D1 and D2 when dial moved off STBY)
4. Set waypoint coordinates via dials
5. Repeat for D1

(Optional)

6. Set wind speed and direction (will be set automatically if using with AN/APN-153 radar)



II. NAVIGATION

Navigation : AN/ASN - 41

Once waypoints are set in the AN/ASN-41 system, the Bearing-Distance-Heading Indicator (BDHI) can be set to NAV CMPTR (Navigation Computer) and the distance and bearing to the selected heading can be seen on the BDHI and manually switched between.

BDHI Heading



BDHI Distance Indicator

BDHI Switch

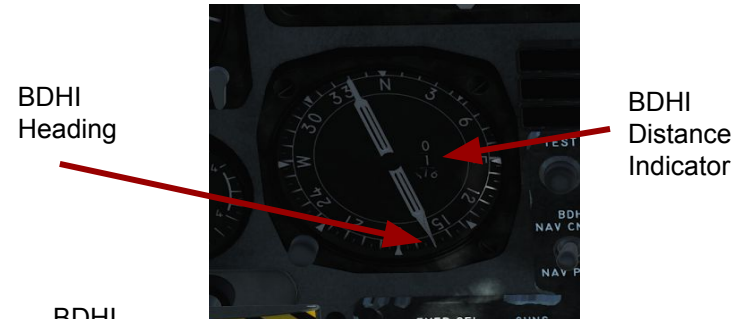
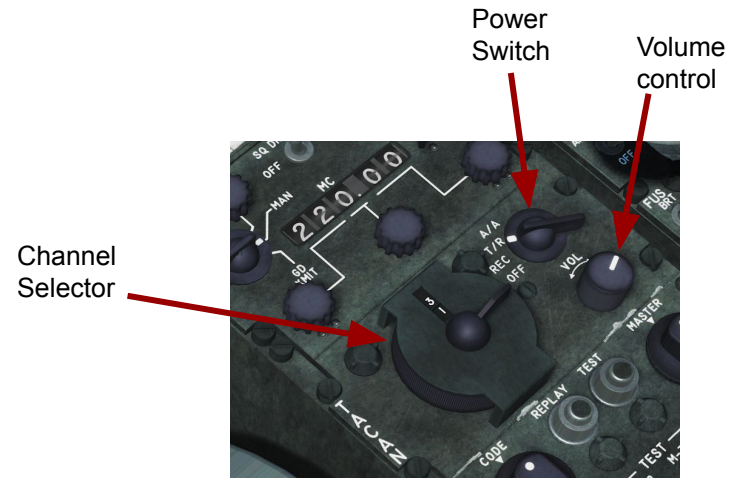


Navigation : TACAN

To tune to a TACAN station:

1. Set power switch to REC
2. After 3 mins switch power to T/R for ground use or A/A for air-to-air use.
3. Set channel on channel selector
4. Use volume control to confirm TACAN is tuned to active station
5. Set Bearing-Distance-Heading Indicator (BDHI) to TACAN

The distance and bearing to the selected heading can be seen on the BDH, on pointer 2 (two bar pointer, pointer 1 is for UHF/VHF use - Not active currently)



12 THX AND EXTRA RESOURCES

Thanks to the A-4E-C team for creating one of the best mods I've ever seen:

- Gospadin (In Memoriam)
- Gyrovague
- Plusnine
- Kryb
- Merker
- Jones
- Farlander
- Dr. Manius

Thanks to Chuck for his amazing guides and okaying my blatant rip-off.

For more information see:

NATOPS A-4E/F/G Skyhawk Manual NAVAIR
01-40AVF-1

Weapons tables from the F-5 Non-nuclear weapons
manual